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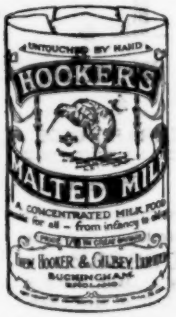

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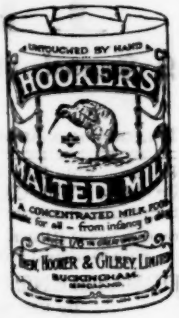

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The Cavendish Lecture

ON

THE FATE OF PATIENTS WHO HAVE HAD STONES REMOVED FROM THE KIDNEY.

Delivered June 23rd, 1916,

BY SIR JOHN BLAND-SUTTON, F.R.C.S.ENG.,
SURGEON TO THE MIDDLESEX HOSPITAL.

MR. PRESIDENT AND GENTLEMEN,—The fate of patients who have had stones removed from one or both kidneys is an important matter, and one on which little has been written. Most of what I have to say on this theme is based on my own experience. I saw Morris remove a stone from the kidney of a woman in the Middlesex Hospital in 1880. The operation is historical; it proved that a stone could be removed from the kidney and the patient survive. In the interval operations for renal calculi have made amazing progress. The detection of stone in the kidney or in the ureter has become an art. The introduction of radiography improved this branch of surgery. A good radiograph indicates the presence of stones; from their shadows the surgeon learns their number, size, and position. Cystoscopy furnishes facts about the condition of the ureters. Clinical chemistry affords information of the value of the renal function; microscopic and bacteriologic examination of the urine completes the clinical picture.

During the past 25 years surgeons have been intent on methods of diagnosis and technique. These are now complete. Errors in diagnosis are so unusual that patients willingly submit to surgical interference when it is certain that the kidney contains a stone. Many patients ask questions concerning the effect on life, and the expectancy of life, when a stone is taken out of the kidney. These questions are easily answered in terms favourable to the patient, but I am anxious for data on which to frame an opinion of the probable frequency of bilateral renal calculi; and on the expectancy of life when one kidney has been removed for calculous disease.

ON PEOPLE WHO LIVE WITH ONE KIDNEY.

When the removal of a disorganised kidney is recommended the patient invariably asks, "How shall I get on with one kidney?" The answer is simple. Many are born with one kidney and lead useful, energetic lives, attain old age, and die ignorant of the fact that they had only one kidney. Hundreds of men and women are living from whom surgeons have removed a kidney on account of stone. Many live unsuspicious that one of their kidneys has been insidiously destroyed by calculous disease. A man with one healthy kidney may live as long as another with two, but often his existence is precarious.

An actor, aged 40, noticed blood in his urine after an attack of severe pain in the right loin. An expert radiographer obtained a deep shadow from the left kidney, but none from the right. The stone in the left kidney was so big that I could feel it through the abdominal wall. The kidney being disorganised I concluded that the patient was "living with one kidney" and suspected, in spite of the radiographer's negative report, that the pelvis of the right kidney contained a small migratory stone. I decided to remove the left kidney through an incision in the linea semilunaris, as this enabled me to examine the right kidney and ureter, but failed to feel a stone. I removed the left kidney; it was a thin-walled sac containing pus and a large branched calculus. (Fig. 1.) Within a month the patient left the nursing home for Margate. Shortly after reaching Margate he was seized with acute pain in the right loin and was unable to pass water. Four days later he came to London in a condition of anuria. A few hours after his arrival I exposed the right kidney by an incision in the loin, let out much urine, and passed a guide down the ureter to the bladder. Next day the patient passed urine naturally; soon he became convalescent, and returned to Margate. An X ray examination showed that the guide I passed down the ureter had pushed a stone, the shape and size of a cherry-stone, into the bladder. Whilst at Margate the patient passed the stone during urination and sent it to me in a pill-box. It is a curious form of retaliation that leads men and women to send renal calculi to surgeons in pill-boxes.

My friend survived the operation six years. As a character-actor he won approbation; like Yorick, he was "a fellow of infinite jest, of most excellent fancy." One evening, whilst waiting for his cue, he was seized with acute abdominal pain and seemed about to die. He was conveyed to a hospital hard by the theatre. A duodenal ulcer had perforated and a prompt operation failed to save him.

This case illustrates what most surgeons quickly learn from experience: a large disorganised kidney stuffed with calculi rarely disturbs a patient, but a small migratory calculus, no bigger than a cherry-stone, in an otherwise normal kidney will render life unendurable by causing frequently recurring attacks of colic. Occasionally, the ureter of the less disorganised kidney is obstructed by one of these troublesome calculi; the patient becomes anuric and is brought, with dramatic suddenness, not only to the brink of, but actually into, the grave. The aphorism, *L'anurique est un individu qui la veille vivait avec un rein* (Legueu), though useful, does not apply to all anurics, for

FIG. 1.

A branched calculus removed from the kidney. Some of the branches, broken during removal, were pieced together after the operation. This stone caused its owner no pain.

an individual may have two good kidneys and each harbour a stone. By an unusual concatenation of circumstances each ureter may be simultaneously blocked by a calculus. Many such occurrences have been recorded. Here is another.

A man, aged 44, weighing nearly 24 st., had suffered from attacks of renal colic and passed fragments of stone at intervals for 29 years. One night he was suddenly seized with acute pain in the right loin and became anuric. On the fifth day of the anuria he was admitted to the Middlesex Hospital and prepared for operation. When wheeled into the theatre he refused to submit to operation, urging that as he was now free from pain there could be no mischief. I saw him an hour later. He was intently reading the third chapter of the Lamentations of Jeremiah, in which the Jewish nation is personified as a man lamenting his own calamities. The following day he voided blood, became alarmed, and submitted to operation. I extracted a conical calculus from the upper end of the right ureter. Sixteen hours afterwards he had a slow pulse, muscular tremors, and contracted pupils. His mind remained clear almost to death, which occurred 72 hours after the operation. At the post-mortem examination the left ureter was

found obstructed by a calculus of the same shape and size as that removed from the right kidney. This man died from simultaneous blocking of both ureters. The pelves of the kidney were not much dilated; there was no sacculation, and the renal cortex showed little evidence of disease.

These two cases illustrate an important feature in regard to the "period of tolerance"—that is the time elapsing between the onset of anuria and the manifestation of uræmia. This is on an average six days. It is an axiom in renal surgery:—*The earlier operation is undertaken after the onset of anuria*, the better the results. Thus the actor who submitted to nephrectomy on the fourth day recovered; the vacillating student of Jeremiah refused operation until the sixth day, and died, although from richness in renal tissue he had the better chance. A great danger besets men and women who have had a kidney removed for calculous disease. At any instant the ureter of the remaining kidney may be blocked by a stone.

In 1890 I removed from a fat cabman, aged 38, the left kidney completely disorganised and crammed with stones. This man suffered no pain from his calculous kidney in spite of the fact that he daily jolted over the stones of London on a cab! Twenty-five years later he was readmitted into the Middlesex Hospital with anuria of three days standing. Though this cabman was very fat, an oval swelling could be felt in the right loin. His kidney was exposed by means of an incision in the loin and the imprisoned urine released. Three days afterwards the patient passed water naturally, made a good recovery, resumed his work, and remains in good health.

The cabman and the actor may be usefully compared. Each lost a kidney, disorganised by calculous disease, and each had been "living on one kidney," as the phrase goes. Each ran risks of dying from anuria, and both were saved by a prompt operation, but the actor had his attack within two months of the removal of the kidney, whereas for the cabman it was delayed a quarter of a century. The cabman is the longest survival after nephrectomy in my practice. He has been living for 26 years with one kidney, and now earns his living with a taxi-cab.

Anuria is the gravest of the many complications of renal calculi. Its sudden onset, in persons apparently in good health, is a most impressive feature: in the early days of the anuria it is hard for them to realise that they are near death. Later, when the signs of uræmia appear, surgical interference is rarely successful. Spontaneous relief, due to the stone being extruded into the bladder, happens in about 25 per cent. Cystoscopy aids here. A cystoscopic examination sometimes reveals a calculus in process of extrusion through the vesical orifice of the ureter. I have seen such a delivery; it occupied two hours. The gradual advance of the stone with each pain was very striking. This is perhaps the nearest trial a man can have of the "pains of labour." With each "pain" the man uttered loud complaints. The preceding cases illustrate the varying attitudes of men to operative treatment; they vary with the phase of the disorder. When Shibli Bagarag rolled his body in the sand within sight of the city of Shagpat he exclaimed—

> On different heads misfortunes come;
> One bears them firm, another faints,
> While this one hangs them like a drum
> Whereon to batter loud complaints.

A man in agony with a stone stuck in his ureter rolls about the bed; clamours for help—clamours loudly; shouts, and willingly submits to operation. When the colic is replaced by anuria, he disdains surgical interference and occasionally mocks at his advisers; but as soon as uræmia stalks anuria he passively submits to what is often a useless operation. Although the risks of an operation on the kidney with uræmia manifest are great, it is useful, like the barber Baba Mustapha, to remember the poet's words:—

> The abyss is worth a leap, however wide,
> When life, sweet life, is on the other side.

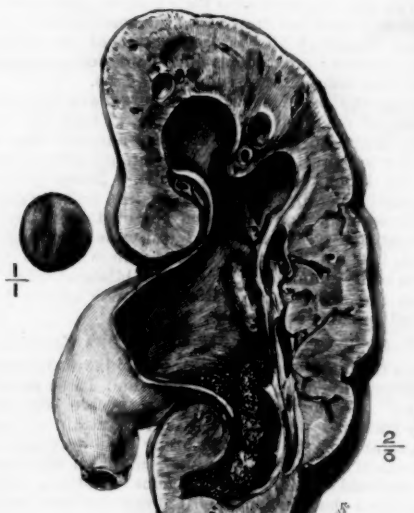
This is the position of a man stricken with uræmia, the sequence of calculous anuria.

BILATERAL AND RECURRENT CALCULI.

Having described examples of bilateral renal calculi in which the disease was advanced in one kidney and unsuspected in the other, we may now consider some in which both kidneys were known to be occupied with calculi. This is an important matter because surgeons hesitate to remove bilateral calculi from fear of inducing uræmia, but there are conditions in which interference is justifiable. Watson collected 230 cases of renal calculi reported by six surgeons; he estimated that in 30 per cent. of the patients stones were present in both kidneys. Among 100 patients under my own care stones were bilateral in ten. At my request Mr. W. A. Coldwell looked through his series of radiographs of calculous kidneys. Among 68 plates in which calculi were clearly shadowed and the stones subsequently removed, in eight the shadows were bilateral.

The risks of recurrence after nephro-lithotomy have never been estimated on a large statistical basis. It is difficult for a surgeon to calculate the proportion of recurrence even in his own practice. Patients have an idea that if a surgeon removes a stone from the kidney he is in some measure responsible if a new stone forms, and betakes himself to another hospital. There is another way in which recurrent renal calculi come under observation. A colleague retires, the patient comes again to the hospital, and is placed under the care of a successor or survivor. Here is an illustration. A woman, aged 28, came under my care with stones in a disorganised kidney. She had been submitted to nephro-lithotomy 12 years previously. I removed the kidney; in the drawing (Fig. 2) you will see the picture of the stone removed at the original lithotomy.

FIG. 2.



Kidney in section. Nephro-lithotomy had been performed and a bean shaped calculus removed in 1889. Twelve years later she came under observation with recurrent calculi. The kidney was removed.

It is probable that sepsis following nephro-lithotomy is in many cases responsible for recurrent calculi. For example: A woman had an enlarged kidney which a surgeon exposed and incised under the impression that it contained a stone. (Fig. 3.) Instead of a stone he found a narrow ureter; to remedy this a plastic operation was performed. The woman recovered without benefit. Two years later she came under my care; a radiograph showed a curious shadow low in the abdomen on a level with the iliac fossa. On exposing the kidney, by means of an incision in the left linea semilunaris, I found the pelvis distended with smooth urinary pebbles. I removed it. With the loss of the kidney the patient lost her aches and pains. It is reasonable to believe that the operation on the kidney led to infection and the formation of calculi. A renal calculus is a heap of crystals held together by cement substance. Thus, after the kidney became infected, crystals were precipitated from the urine and cemented by inflammatory exudate. Gall-stones often contain a central clump of bacilli, and have been compared to pearls which frequently contain a small worm as a nucleus. Gall-stones, like renal calculi, are tokens of pain and misery, but pearls, emblems

of beauty and riches, are worn without any regard to the pain they may have caused the oysters. I have had many renal calculi examined in the expectation of finding a clump of bacilli as a nucleus; so far without success. Micro-organisms are excreted by the kidney, and it is probable that the nucleus of a primary renal stone may be occasionally a clump of bacilli. Recurrent calculi are commonly associated with septic changes in the kidney. In the infancy of nephro-lithotomy the operation was not carried out with the precautions and ritual which attend it to-day. A free incision was made in the cortex of the kidney; its pelvis and calyces were explored with a bare

FIG. 3.

Hydronephrosis associated with a narrow ureter. The pelvis is occupied by urinary pebbles.

and often septic finger. In many cases a rubber tube was introduced into the pelvis of the kidney for drainage; this provided a high road for an invasion by pyogenic organisms. Bacillus coli soon colonised the pelvis. When surgeons turned their attention to this matter it gradually became the habit in suitable cases to remove calculi through an incision in the pelvis of the kidney and carefully close the opening with sterile sutures. Primary union and speedy convalescence often follow with advantage to the patients; they recover quickly, suffer less, and run less risk of a recurrent calculus. We must not lose sight of the fact that many calculous kidneys are septic at the time of the primary operation.

Calculi sometimes form in kidneys in enormous numbers without the least evidence of sepsis. In 1904, a gardener, aged 38, had signs of stone in his right kidney. The radiograph showed such a large shadow as to make me doubt its accuracy. During the removal of this kidney I had a great surprise; on withdrawing it from the loin the sacculus containing the stones burst. In an instant the operation area was covered with hundreds of iridescent calculi resembling little balls of burnished gold. We tried to pick them up, but they ran over the towels, slipped between them, dropped on the floor like hail, and were as elusive as globules of quicksilver. The collected calculi to the number of 40,000, are preserved in the Museum of the Royal College of Surgeons. I saw this gardener in good health 12 years after the operation and still grateful for the relief the operation afforded him. The College Museum contains a similar specimen; the calculi number 27,000. They are of the shape, size, and colour of millet seed.

SURGICAL TIMIDITY.

The conservation of a disorganised and septic kidney (Figs. 2 and 3) exposes patients to the risk of future suffering from recurrent calculi. This entails repeated operations and, finally, removal of the kidney under adverse conditions. Endeavours to save such damaged kidneys are not examples of cautious surgery, but rather glaring instances of surgical timidity.

We are all more or less influenced by a wholesome respect for renal tissue. We know, too well, that some men get on in the world with very little brains; some with none. But no man can live without a certain amount of kidney. Some push this witticism too far. Many patients suffer much discomfort, even misery, from a timid nephrotomy when their best interests demand bold removal of the disorganised kidney. When a kidney is septic, calculous, and disorganised, if its companion is normal the diseased kidney should be removed. I have watched many patients, men and women, who have led vigorous lives after nephrectomy for calculous pyonephrosis.

It was my habit to give patients the stones I removed from their kidneys. A bad habit. The stones serve as souvenirs of discomfort and agony. Listen to a sufferer, an Italian poet:—

> Other white stones serve to mark happy days,
> But mine do mark days full of pain and gloom.
> To build a palace, or a temple fair,
> Stones should be used; but mine do serve
> To wreck the fleshy temple of my soul.
>
> Well do I know that death doth whet his glaive
> Upon these stones, and that the marble white
> That grows in me, is there to form my tomb.
> (*Ciri de Pers.*)

These depressing lines represented at the time they were written the helpless condition of patients suffering from stone in the kidney. The natives of the southern part of America, at the time the continent was discovered, wore amulets of jade as a remedy for renal colic. This is how jade got from Spaniards the alternate name of nephrite. Fifty years ago in Europe the treatment of stone in the kidney had not got beyond the stage of physic. Amulets in another form, says the caustic critic.

ABSTRACT OF

An Address

ON

THE PREVENTION AND TREATMENT OF CHOLERA.

Delivered before a Medical Conference in Malta,

BY STAFFORD M. COX, M.D. DUB.,
MAJOR, ROYAL ARMY MEDICAL CORPS.

MR. PRESIDENT AND GENTLEMEN,—If cholera visits Malta it will necessarily be seaborne. Local conditions are not favourable to the disease becoming endemic, but infection of the wells would be a serious feature.

PREVENTIVE MEASURES.

Of first importance as a general precautionary measure is the vaccination against cholera of all troops in or passing through Malta. During an actual outbreak vaccination is associated with greater individual risk owing to the increased susceptibility induced for the first few days. As to hospital accommodation, a tent hospital for 50 patients would probably suffice; it should be placed at a point easily accessible and yet remote from road traffic. Fly-proof cesspits and latrines, open to the sunlight, are essential. Quicklime is recommended for these as the best drying and disinfecting agent. In choosing a site the possible contamination of existing wells should be remembered. A segregation or detention camp in close relation to the hospital will be needed for the isolation and disinfection of contacts. Probably a week's detention after each fresh case would suffice. In addition discharged contacts should have their addresses registered, and for another week report daily at the hospital. During the detention period each contact should be immunised with Wright's prophylactic. Contacts becoming cholera suspects should be placed in an observation tent line. The same general measures with regard to latrines and cesspits should be observed. A special form of transport, preferably motor, should be provided for the patients.

In the event of an actual outbreak the guard on reservoirs, should be strengthened; all wells, ships' tanks, &c., should be treated with permanganate of potash. Advisory circulars should be issued to both the military and civil population concerning what to eat and what to avoid. Aerated water factories should be officially supervised, and instructions issued generally for the regular testing and cleansing of filters. In the presence of an epidemic it is questionable if filtration alone is sufficient against this water-borne disease. A defective filter is worse than none, and in my experience 20 per cent. of the portable filter cores marketed are defective. Bacteriological examination of the water-supply from the reservoirs and wells should be regularly made. Freshly isolated bacilli show the most typical morphology. Subcultures often show rod and coccoid forms due to medium reaction. Cholera red is often obtained with difficulty. Pure 24 hours' subcultures give best results. It is by immune reactions cholera is best identified.

TREATMENT.

There is little hope of treating the fully developed disease by a bactericidal serum. I used the Pasteur serum in the intravenous infusion in 1907 in 24 cases, with a mortality rate of 33 per cent., as compared with 26 per cent. for 65 cases where the saline alone was used. This was probably accidental—the number of cases was too small to indicate more than that; exceptional advantages are not to be expected from its use. Doubtless bactericidal sera when employed in other acute diseases are considerably helped by the body cells in the elaboration and neutralisation of toxins. In the collapse stage of cholera the circulatory derangement is so great and the body resources are so exhausted that little help can be expected from the patient's tissues. Serum treatment, therefore, would seem to be contra-indicated as likely to hasten the breaking-up of the vibrios, the evolution of their endotoxins, and a speedier intoxication in the absence of assistance from the body cells. All attempts to produce a potent antitoxic serum have so far failed owing to the difficulty experienced in procuring the corresponding circulant toxin.

The best hope of combating the disease from this point of view is therefore in the prophylactic treatment, by inducing an active immunity sufficient to destroy the bacteria that enter the body before they have time to increase. Mild infections will probably be fully met by this means, but severe primary infections will still probably show the incompleteness of the immunity given. Three forms of prophylactic inoculation have been chiefly used. Haffkine uses the living cultures in two injections of two strengths, giving immunity in ten days. The severe local reaction is the main objection to its use. Protection is supposed to be in proportion to the reaction. Strong employs an autolysate. It produces no reaction. 2–5 c.c. are usually given, but mass doses can be used. Wright's prophylactic inoculation also produces no appreciable reaction. 150,000 of the Serbian troops have been inoculated by the Royal Army Medical Corps with this prophylactic without accident.

Treatment solely by medicine is admissible only in mild or incipient cases. The drugs most in use are intestinal antiseptics, such as urotropin drinks, permanganate of potash, castor oil, and chlorodyne. Cardiac stimulants, such as digitalin and pituitary body. Saline douches are useful. Morphia should not be given if the blood pressure is under 100 mm.

TREATMENT OF COLLAPSE STAGE OF CHOLERA.

The chief conditions indicating treatment are: (*a*) Lowered blood pressure; normally 120–130 mm. this may fall to 50 or 60 mm., causing a cessation of kidney function. (*b*) Concentration of blood. The normal specific gravity of 1055 may rise to 1080. This would correspond to a loss of about two-thirds of the fluid constituents. The blood becomes tarry and circulates with difficulty. (*c*) Loss of vaso-motor control of capillaries, especially in the intestinal canal, attributed to absorption of the endotoxins. A drainage of the blood fluid into the intestinal canal is thus set up, forming the characteristic rice-water stools and vomit. (*d*) Cardiac angina and cyanosis. (*e*) Great loss of body heat. The temperature in the axilla or mouth varies from 95° to 97° F., being usually somewhat higher in the rectum. The extremities fall to practically the temperature of the surroundings; the patient is chilled to the bones. The skin becomes as plastic as that of a corpse, retaining for some considerable time the shape given by pinching it.

I draw particular attention to this great backward swing of the pendulum of body heat, which in the nature of things, if the patient recovers, we would expect to be followed by an almost equally marked forward oscillation, with all the phenomena of returning animation, as is seen in other allied conditions of chill. Spontaneous reaction from this extreme condition is rare, and if it occurs is associated with pyrexia of a more or less continuous type, forming the group of symptoms classified as the stage of febrile reaction. Happily, intravenous saline transfusion produces an adequate reaction without these features. It is found that when about 5 pints of fluid have been infused the patient—who has then lost his cramps, has had his pulse restored, and perhaps shows a temperature of 100°—*invariably* develops a rigor proportionate in severity to the degree of collapse; the patient's teeth rattle like castanets, he is seemingly extremely ill, and an inexpert attendant would probably stop the transfusion.

To divert for a moment, Rogers, in his most excellent work on cholera, rallies me for the use of hot-water bottles in cholera, and states he has banished them from his wards. His statement is quite correct. I use hot-water bottles and even extra blankets, but only for the ten minutes occupied by this stage of transfusion rigor, through which all patients adequately treated with saline must pass. I have most carefully read his work on cholera and can find no description whatever of his patients having "transfusion rigors." If they have no rigors I can understand their not needing hot-water bottles. I regard this condition as all essential, and should it, as sometimes happens, be delayed through the solution running cold or a kink in the tube stopping the flow impaired results must be expected. The average amount of saline transfused by Rogers is 4 pints, in exceptional cases 5 pints; this just falls short of the amount which produces the reaction rigor, and the presumption is that Rogers does not carry his transfusion to this point, has not seen the reaction rigor, and therefore does not use hot-water bottles. The comparatively moderate results he has obtained using means that practically correspond in kind, but not in degree of use, would seem to confirm this explanation. They are as follows: his are taken from his work on cholera, using hypertonic saline; mine were obtained using isotonic saline.

India.	*China.*
Rogers, 1910 and part 1909.	Cox, 1909.
Collapse stage cases only.	Collapse stage cases only.
Number of cases, 103.	Number of cases, 666.
Average amount transfused, 4½ pints.	Average amount transfused, 13 pints.
Mortality, 32 per cent.	Mortality, 18·8 per cent.

In this connexion an interesting point remains to be noticed. Rogers strongly denounces the employment of opium in any form in cholera and has never seen any but ill-results from it. This, again, seems due to inacquaintance with the transfusion reaction rigor; the indications for its employment are then most manifest. I have found severely collapsed cases, once they pass the stage of rigor, much benefited by ¼ grain each of morphia and belladonna extract. The blood pressure is then rising rapidly and interference with the kidney function has never been seen to result. Apart from its use in this respect I am quite in agreement with this high authority that it is contra-indicated.

The proportionately greater loss of body chlorides in the stools of severely collapsed cases pointed out by Rogers induced me in 1913 and 1914 to use hypertonic strength with a proportionate decrease in the amount of fluid. In some 45 cases I used an average of 8½ pints of hypertonic solution with good results. I found that this procedure lessened the tendency to relapse. Hypertonic strength should therefore be used in preference to isotonic until an average amount of 7 to 8 pints for adults has been introduced; after that, if more fluid is required, isotonic should be used. The fluid necessary is estimated by the blood pressure and specific gravity.

WORKING NOTES.

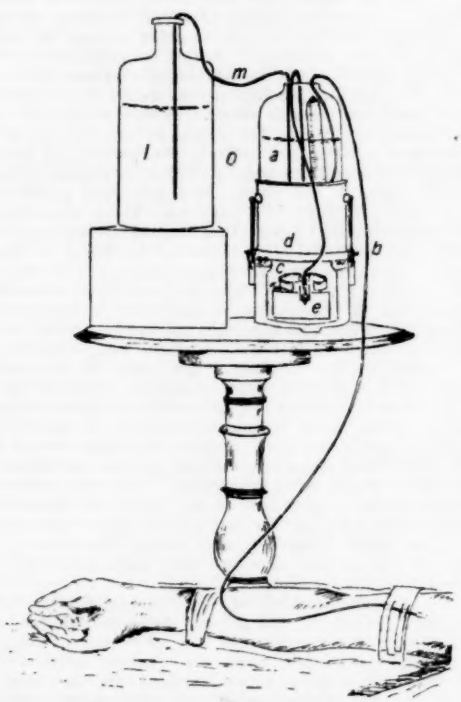
Few medical procedures show a more striking correspondence between the care exercised and the result attained than intravenous infusion in cholera, and this is the only apology offered for the perhaps over-elaboration of details which

follow. As the collapse stage is the most important phase of the disease and the only one requiring this treatment, that stage only will be dealt with.

My acquaintance with the disease was gained at Shanghai, where since 1907 I had charge of the Chinese cholera hospital, and have treated over 2000 cases. I used an apparatus devised by R. H. Cox, F.R.C.S., by which a solution of saline in boiled water is led to the vein through a filter placed in circuit, and is maintained at the temperature desired by an adjustable heat-regulating mechanism. Sir Leonard Rogers uses an apparatus consisting of a cistern, tubing, and a stopcock for regulating the flow, through which he introduces 4–5 pints of hypertonic saline in distilled water in 20 minutes. The chief disadvantage in this method lies in the difficulty in procuring freshly distilled water, except in times of peace or at a base. Apart from this, the rate of flow indicated is too quick per minute, except in the first two pints, in severely collapsed patients. The quantity (4–5 pints) is also insufficient to induce the reaction rigor.

The advantages of the method of continuous intravenous saline infusion are: 1. A regulated flow at a constant temperature can be maintained. 2. Boiled water, an easily procurable commodity, is used. 3. A considerable number of cases can be maintained running at the same time; the apparatus being self-regulating requires little attention. 4. The rate of flow is more gradual than that used by Sir Leonard Rogers (approximately 2 ounces per minute) and the transfusion lasts (approximately) 1½ hours. Less bodily disturbances

FIG. 1.



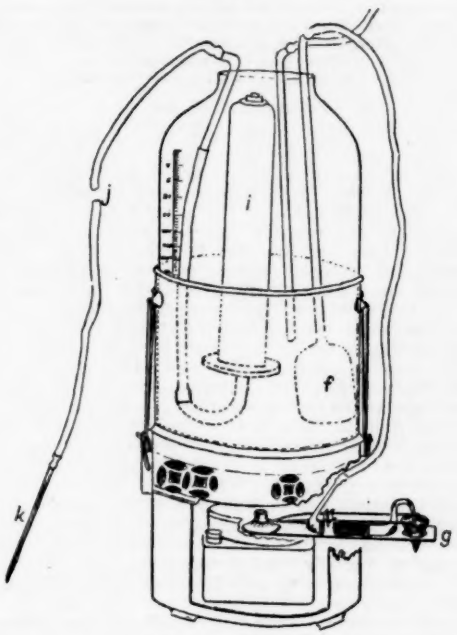
Earlier form of transfusion apparatus, taken from a Report on an Outbreak of Asiatic Cholera in Shanghai during the Summer of 1907 by Stafford M. Cox, M.D. (Methodist Publishing House, Shanghai, 1908.) *a*, Glass cistern. *b*, Metal stand consisting of two compartments—*c*, a chamber for the spirit lamp, and, *d*, water-bath for cistern. *e*, Spirit lamp. *l*, Reservoir of saline. *m*, Feed tube from reservoir to cistern.

and a more permanent condition of reaction result. 5. The reaction rigor is obtained. A detailed description of the apparatus is omitted, as apart from the sets (40) provided for the use of the writer it is not available. The illustrations given (Figs. 1 and 2) depict an earlier form of the apparatus, but the essential features apart from the heat-regulating apparatus can be readily improvised, and the procedure and requirements for doing so will now be detailed.

Requirements.

1. A Berkefeld filter candle (the type used in the Berkefeld travelling pump). Efficient English substitutes of similar size are now procurable. 2. A wide-mouthed jar (preferably of glass) as a reservoir with a capacity of 4–5 pints. 3. 2½ yards of rubber tubing—viz., an upper length of 1 yard and a lower of 1½ yards, joined either by a piece of glass tubing which will serve as an observation tube for bubbles or a glass bubble-catcher. 4. A glass cannula made with a bulbous neck giving secure invagination in veins of different calibre, and with a fine point to facilitate

FIG. 2.



The glass cistern on a larger scale. *f*, *g*, Temperature regulating mechanism. *i*, Berkefeld filter core. *j*, Position of glass bubble-catcher or of observation tube. *k*, Glass cannula for insertion into vein.

entry. This can readily be drawn in a spirit flame. 5. A bath thermometer taken from its wooden case and allowed to float in the reservoir. 6. Some 10–12 bottles (peroxide of hydrogen type) with glass stoppers and wire fittings, to be ready filled with hypertonic saline (1·33 per cent.), 6 with hot and 6 with cold saline. 7. A Berkefeld travelling pump (similar sized English can now be obtained). 8. If a bubble-catcher is used it will replace the observation tube joining the rubber lengths. It can easily be made from a small glass syringe by removing the piston and replacing it with a cork (preferably of rubber) pierced with a piece of glass tubing 4 inches long with an equal inside and outside projection. The bubble-catcher must be held in a vertical position by strapping during infusion.

Nos. 7 and 8 are recommended if available, but are not essential. At least 20 per cent. of candles show faults. In the absence of a bacteriological examination of filtrate the candle should be tested by blowing through a short rubber attachment into the emptied and damped chamber whilst submerged in water. Small faults, shown by a stream of bubbles, can be closed with cement or plaster-of-Paris.

Sterilising often causes faults and should be started at a moderate temperature, using a tray. A good effective sterilisation can be made by placing the candle in a Berkefeld travelling pump and driving a solution of hot permanganate of potash through. If a steriliser or pump is not available the candle should be repeatedly filled and emptied with the same solution.

Causes of ineffective flow are:—1. Deposit of salt crystals. Treatment: Light brushing, running through with Berkefeld pump in hot water. 2. Lessening of filtration area, from the presence of air in the inverted chamber. Treatment: Remove the cannula, restore the candle to erect position in the reservoir, dislodge the air, reinvert, and return cannula to the vein.

The rubber tubing is best disinfected by boiling or syringing through with boiling solution of permanganate. The connexion should be secured with soft silk.

For a delivery into the vein at 99°–100° with summer heat conditions using a tubing 2½ yards long, a cistern elevation from the vein of 3 feet, and a cannula with a bore which gives 2 ounces of saline per minute in a jet 3–4 inches high; the temperature at which the cistern saline will require to be maintained will be found to be between 106°–108°.

As to the procedure for infusion, the filter candle (scrubbed, tested, and sterilised) is filled by hanging on the side of the elevated cistern (filled with saline at the appropriate temperature), the rubber tubing is then attached *in situ*, and the tube is milked till a current is established. All contained air is then removed by placing the candle slantwise bodily in the container and raising the tubing to form an upward curve, using both hands. As the right hand progresses with the air along the tube the left depresses the tubing emptied of air to prevent its return, and this procedure is continued till the uptilted cannula is reached. The candle is then inverted in the cistern and the apparatus is ready for use; if a bubble-catcher is used inversion is not necessary.

Intravenous Infusion.

An adequate reaction proportionate to the degree of collapse must be looked for and assisted. This condition is never attained until the infusion reaction rigor (which occurs approximately when 5 pints have been infused) is well passed. The continuance of the saline infusion after the occurrence of the reaction rigor up to 8–10 pints will procure the following benefits: 1. Dilution of the blood. 2. Elevation of the blood pressure, with re-establishment of suppressed renal flow. 3. Elimination of the endotoxins from the blood and later from the stools, thus obviating the onset of the febrile reaction stage of cholera, the remainder of the illness being usually apyrexial. No apprehension need be felt at a rise of temperature to 103° during the infusion; in fact, this degree of temperature oscillation I consider the most favourable for cessation of infusion, provided that more than 6 pints have passed in. If pyrexia of 103° is associated with the infusion of less than 6 pints, the temperature of the saline in the cistern should be lowered and the infusion continued.

Where the stools are sanious (a condition usually associated with a high rectal temperature) the saline should be infused at 98° or less, and 5 or 6 pints used. Such cases need a specially careful treatment, the associated dysenteric condition being only benefited indirectly by the relief of the collapse.

Strangely enough, I have found marked collapse when it is due solely to the loss of blood fluids a favourable index in prognosis as showing an absence of febrile complications, and such cases, however profoundly collapsed, give excellent results. In such instances where the pulse is absent and death seems imminent, the rate of flow should be started at 4 ounces per minute, until the pulse returns. If delivery of saline to this extent cannot be obtained by elevating the cistern and using a cannula of a wider bore, a vein on the opposite side should be opened and fed from an additional candle which may be placed in the same container. On the return of the pulse to the wrist, one apparatus will be found sufficient to ensure reaction.

The associated conditions in this form of collapse are: (1) Marked plasticity of the skin; (2) great backward swing of the body heat, as evidenced by icy chilliness of the extremities, an oral temperature of 95°–96° and a rectal somewhat higher; (3) an unrecordable blood pressure; (4) a blood specific gravity in the neighbourhood of 1080; and (5) usually intense cramps. In such cases a marked rigor must be expected and hot-water bottles and blankets held in readiness, usually also a 1/40 grain of morphia with 1/100 grain of atropine hypodermically will be found useful, after the rigor is passed.

The preparation of the vein selected is carried out in the usual way, no anæsthetic is necessary; the cannula is fixed in position by adhesive strapping, the arm placed on a splint and secured to a bedstead in anticipation of the muscular movements caused by the reaction rigor. Straw palliasses and tin floor-trays are advisable. If the hospital has a more or less permanent character a tin-floored transfusion-room is recommended.

That the reaction induced by saline transfusion may, to some extent, be due to a toxæmia induced by the endotoxins of water-borne bacilli used in the infusion is possible; that it entirely accounts for the reaction rigor I do not believe. In any case, it will be interesting to see to what extent the phenomena of the infusion reaction will be modified by filtration previous to boiling.

REMARKS ON THE

CAUSE AND NATURE OF THE CHANGES WHICH OCCUR IN MUSCLE AFTER NERVE SECTION.

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Two theories have been put forward to account for the obvious fact that section of a nerve causes trophic—i.e., nutritive—changes in the muscle it supplies. One is that there are special nervous impulses affecting nutrition different from those causing contraction. Since there is no independent evidence of the existence of such impulses, this theory has received little support. The other is that the maintenance of the nutritive condition of the muscle depends upon its contracting at intervals, so that when the normally occurring contractions are prevented by nerve section the nutritive condition of the muscle suffers, and it gradually loses weight and decreases in irritability. This theory has in its favour the fact that normally the size of muscles is, within certain limits, dependent upon exercise. In accordance with it the wasting of denervated muscle is spoken of as "disuse atrophy," and largely on the basis of this theory it is a common practice to induce contraction in paralysed muscles by stimulating them with condenser or galvanic currents. If this theory were true, a certain degree of contraction brought about by electrical stimulation would keep the denervated muscles in a normal condition. It need hardly be said that this never occurs in clinical practice. In man the degree to which electrical stimulation prevents wasting of the muscles cannot be determined with any accuracy. A few experiments on this point were recently made on rabbits by Professor Kato and myself.[1] The tibial or peroneal nerves were cut on both sides and the paralysed muscles stimulated on one side with condenser currents. Taking the weight of the muscles on the unstimulated side as a standard, the percentage gain in weight on the stimulated side in the four experiments made was: 18 days, 0; 28 days, 22·9 per cent.; 36 days, 9·8 per cent.; 71 days, 10·3 per cent. These experiments, whilst suggesting that contraction delayed the wasting of the muscles, were not definitely in favour of the theory of "disuse atrophy," for in each experiment great wasting of the muscles occurred and the sluggish response to electrical stimulation characteristic of denervated muscle was not prevented. Further, the difference in weight on the two sides might possibly be due to individual variation, and I have since found variations up to about 7 per cent. in the weight of the muscles on the two sides in normal rabbits.[2] In the experiments mentioned above, the extent of daily stimulation was not the same in the several experiments: it varied from less than, to about that usually applied in cases of man. The absence of decisive delay of atrophy might then be due to the degree of stimulation being insufficient. I have in consequence made two further experiments on rabbits, in one stimulating for about 2½ hours a day for rather more than three weeks and in the other extending and flexing the limb for a like period. In neither case was there any certain delay in the wasting of the muscles.

Since, then, contraction of the muscles neither for a short daily period nor for a long daily period prevents the wasting of the muscles nor the occurrence of sluggish contraction, I conclude that the changes which take place in muscles after nerve sections are not due to absence of contraction, and that the term "disuse atrophy" is a misnomer. In this case we have to look for some other cause of the atrophic and other degenerative changes. It was noticed by Professor Kato and myself that muscles from about the fourth day after section of their nerves are in a state of continuous fibrillation—i.e., the separate muscle fibres contract rhythmically, but with different rhythms; the muscles present a shimmering appearance when viewed by light reflected from their surface. The contractions cause no movement of the muscle as a whole,

[1] Journal of Physiology, xlix., p. 432, 1915.

[2] It may be mentioned that it is necessary to examine the muscles and bones for signs of previous injuries. Thus in one case in which the tibial nerve on one side was cut, the gastrocnemius on the denervated side was heavier than that on the side with nerve intact, but on examination of the bones on this side a large callus was found indicating that the lower leg had at some time been broken, and that the muscles in consequence had not obtained their proper size.

and are easily overlooked; possibly they could be shown in man by the use of the string galvanometer. As each fibre contracts many times a minute the total expenditure of energy in the day must be considerable. It is, then, I think, reasonable to suppose that this continued activity of the muscle fibres must cause fatigue, and that the atrophy of muscle is due to too great rather than to too little functional activity. The changes in reaction which occur in denervated muscle are, in fact, like those caused by fatigue. I have, however, not found any definite evidence that the stimulation is harmful. With regard to this, it has to be borne in mind that contraction drives on lymph and tends to prevent the accumulation of metabolic products. It may also cause an after-increase of the blood flow, and in the later stages of paralysis at any rate when the blood-vessels have recovered tone, this would no doubt be beneficial. But on the whole it appears to me probable that it would be better to obtain these accessory results of contraction without the contraction itself. And in the recent discussion on Dr. F. Hernaman-Johnson's paper on the use of condensers in the treatment of nerve lesions[3] Dr. E. P. Cumberbatch states that he has obtained good results by the use of sinusoidal alternating currents not causing contraction.

There are two points I would comment on with regard to the reaction of denervated muscle to electrical stimulation.

1. Cases were early noticed in man in which, after nerve severance, voluntary power may return before the response to faradic currents, and in the recent use of condenser currents it has been found that voluntary power may return without a return of response to condenser shocks of short duration.

It has long been known that in the early stage of regeneration, tetanising currents applied above the point where the ends of the severed nerve were united will cause contraction whilst similar currents applied below it have no, or less, effect. Some instances of this in the limb nerves are given by Howell and Huber,[4] together with earlier references, and I have found a similar condition after joining the vagus to the cervical sympathetic.[5] The result has been spoken of as showing that nerve fibres in regeneration recover conductivity before irritability. The difference is probably one of difference of response to currents of different duration, and to this may be attributed the return of voluntary power before return of response to currents of short duration.

2. The fact that faradic currents as applied in testing the reaction of muscles in man cease to cause contraction four to seven days after nerve severance, whilst recognised as partly due to the disappearance of nerve irritability, is often taken as showing that the muscle fibres themselves have lost their irritability to faradic currents. In support of this view it has been urged that in animals the effect of the nerves may be abolished by curari, without abolishing the faradic irritability of the muscles, so that in man the disappearance of the latter must be due to a change in the muscles. But several observers have noted response to faradic stimulation in the exposed muscles of animals several weeks, at any rate, after denervation, and I have obtained it in the exposed muscles of the rabbit at all times up to 10 weeks, the longest period I have tried. In consequence I should attribute the absence of response which occurs in man to the currents employed being too weak.

I have not made sufficient experiments to be certain of the progress of decrease of irritability to induced currents in denervated muscle, but, so far as my experiments go, it is slow and gradual. In lower vertebrates the irritability of muscle fibres is greater in the region near the nerve-ending—the neural region—than in other parts of the fibre, and no doubt the same is the case in the mammal. In this case the extent of the contraction on stimulating the denervated muscle directly will depend on the position of the electrode with regard to the neural regions of the muscle fibres. In general, most of the neural regions lie in an oblique band somewhere near the middle of the muscle, and are absent in the end portions.

It is possible that a sudden drop of irritability occurs in the neural region in the later stages of denervation; I have not noticed this in my experiments, but some recent observations of Professor Noel Paton and Dr. L. Findlay[6] suggest its occurrence when galvanic currents are used.

[3] Proc. Roy. Soc. Med., Surgical Sect., 1916, p. 1; THE LANCET, Feb. 12th, 1916, p. 351. [4] Journal of Physiology, xiii., p. 364, 1892. [5] Ibid., xxiii., p. 251, 1899. [6] Ibid., l., p. 193, 1916.

THE DIAGNOSIS OF CANCER OF THE STOMACH.[1]

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CANCER of the stomach is from several points of view one of the most important conditions which claim our attention. It is important from its frequency. The stomach comes next to the uterus as the seat of cancer. Cancer of the stomach accounts for 1·5 per cent. of all deaths occurring in hospital practice. It is important because early diagnosis is often a matter of extreme difficulty, and also of the greatest importance, if operative intervention is to have any fair prospect of success. It is important, finally, because to suggest to a patient an unfounded suspicion of cancer is one of the most serious and unfortunate of errors.

During the last 14 years 40 cases of cancer of the stomach have occurred in my practice at the Royal Victoria Hospital. I am much indebted to my assistant, Dr. S. I. Turkington, for the careful manner in which he has collected and collated this material for me. I shall confine myself to the diagnostic problem, leaving the question of operative measures in the very capable hands of Mr. A. B. Mitchell.

1. *Age of patients.*—No case occurred under 30 years of age. Fourth decade, 5 cases, 12½ per cent.; fifth decade, 7 cases, 17½ per cent.; sixth decade, 19 cases, 47½ per cent.; seventh decade, 8 cases, 20 per cent.; over 70, 1 case, 2½ per cent. These figures are in accord with general experience. The disease falls mainly upon the fifth, sixth, and seventh decades of life, with a slight preponderance in the sixth decade. Cases are not unknown in earlier life. The disease is not rare at advanced ages.

2. *Sex.*—Males, 23; females, 17. Most observers report a preponderance in the male sex. The proportion is usually given as 5 to 4, which is in close correspondence with my own figures. Some authorities report a considerably higher proportion of males, while Fenwick thinks that the sexes suffer equally. The Registrar-General's Reports for England and Wales (1901–1909) show that in males cancer of the stomach accounts for 21·4 per cent. of all deaths from cancer, but in females the figure is only 14·2.

3. *Family history.*—There was a clear family history of cancer in 4 cases—i.e., in 10 per cent. In a fifth case there was a history of doubtful "gastric disease." One woman stated that her husband had died of cancer. In the remaining 34 cases the family history was unimportant.

4. *Personal history.*—A history of previous gastric ulcer was obtained in only 5 cases—i.e., 12½ per cent. There is a curious, almost disconcerting, discrepancy between physicians and surgeons as to the frequency with which simple gastric ulcer precedes gastric cancer. Habershon found this sequence in only 5 cases out of 340. Fenwick puts the proportion at 3 per cent. Osler found the sequence in 4 cases out of 150. On the other hand, Mayo puts the proportion at 54 per cent. and Moynihan at 72 per cent. This is a very important matter from several points of view. If the higher figures are correct we shall be compelled to regard the remote dangers of gastric ulcer much more seriously than we have hitherto done. Further, physicians have been in the habit of regarding the comparatively abrupt development of painful dyspepsia after the age of 40 as one of the most significant indications of commencing gastric cancer. It is evident that if simple ulcer is a common antecedent of gastric cancer this rule will fail us. It is not easy to reconcile the higher figures with the preponderance of cancer in the male sex, nor with the marked contrast between the results of the examination of the gastric contents in the two conditions. My figures support the views of Habershon, Fenwick, and Osler.

Four patients gave a history of alcoholic excess. Osler found this history in 8 cases out of 150. There is no reason to conclude that alcoholism is a factor in the causation of gastric cancer.

In 26 out of my 40 cases the previous digestion of the patients was reported to be good.

5. *Mode of onset and initial symptoms.*—"Signal symptom

[1] Introduction to a recent discussion at the Ulster Medical Society.

or symptoms"—i.e., symptom or symptoms which first attracted the patient's attention.

(*a*) Painful dyspepsia	15 cases	...	37½ per cent.
(*b*) Vomiting and pyrosis	9 ,,	...	22½ ,,
(*c*) Loss of weight	6 ,,	...	15 ,,
(*d*) Progressive weakness and anæmia ...	4 ,,	...	10 ,,
(*e*) Hæmatemesis	3 ,,	...	7½ ,,
(*f*) Anorexia	2 ,,	...	5 ,,
(*g*) Melæna	1 ,,	...	2½ ,,

This table is important, as in practically every case of gastric cancer symptoms precede signs, and early diagnosis is dependent mainly upon symptoms.

Painful dyspepsia was the earliest initial symptom in the largest group of cases, and this is in accord with general experience. The pain is less severe than in simple ulcer; it is less definitely referred to the epigastrium or the back; it tends to radiate towards the hypochondria; its relation to the ingestion of food is less close; local tenderness is, upon the whole, less marked and less definitely localised; if vomiting ensues the relief of pain is less complete than in simple ulcer. Hale White's rule is valuable—"Painful dyspepsia arising for the first time in a patient over 40 should lead to inquiry for gastric cancer." Constipation is the almost invariable rule in these cases.

Vomiting and pyrosis marked the onset in the next largest group of cases—9 cases out of 40. When occurring early in the disease, these symptoms may depend upon gastric catarrh; when occurring later they suggest interference with gastric motility, and their time-relation to the ingestion of food depends upon the seat of the growth, being earlier in cancer of the cardia, later in pyloric growths. The vomited matter may be mucous, watery, rarely bilious, often offensive. Blood is present in the vomit in 42 per cent. of cases, according to Brunton. It may take the form of "occult blood."

In 6 cases out of the series the first symptom to attract attention was an unexplained loss of weight. Careful weighing is a matter of the first importance when the presence of gastric cancer is suspected. The weights on admission in my series of cases were as follows: Under 6 st., 3 cases; 6 to 7 st., 5; 7 to 8 st., 8; 8 to 9 st., 8; 9 to 10 st., 8; 10 to 11 st., 2; over 11 st., 1; no record, 5. Of the 6 cases where loss of weight was the "signal symptom," 2 had lost 3 st., 1 had lost 2 st., and the remaining 3 had lost smaller amounts. Sixteen cases gained weight while under treatment, of whom 5 gained 1 lb., 4 gained 2 lb., 1 gained 3 lb., 3 gained 4 lb., 2 gained 6 lb., and 1 gained 10 lb.

In 4 cases—10 per cent.—the earliest symptoms were progressive weakness and anæmia. This is an important group, as in it the difficulties of diagnosis are often at a maximum. Pronounced blood changes are usually late in the disease, but in an important minority of cases anæmia may be early and marked. The red cells may fall to one and a half millions or less, poikilocytosis may be pronounced, and microblasts and megaloblasts may be present. The distinction from pernicious anæmia may be difficult, or even for a time impossible.

In 3 cases—i.e., in 7½ per cent.—hæmatemesis was the first symptom to attract attention. This is unusual, but, as already stated, its occurrence at some stage of the disease is common. Brunton says 42 per cent.; Boas 36 per cent. The amount of blood lost is rarely large. A free hæmorrhage speaks for ulcer rather than for cancer.

Anorexia was noted as the "signal symptom" in only 2 cases of the series. It is probable that the hospital records or the memory of the patients was in error on this point. General experience testifies that a somewhat abrupt failure of appetite, especially for flesh foods, is common in gastric cancer, and that its diagnostic importance is considerable. It is, of course, important to exclude other possible explanations of the anorexia, of which alcoholism, avowed or secret, is one of the most common.

In only 1 case in the series was the patient's attention first arrested by an attack of melæna. It is probably quite rare as an initial symptom. Later in the disease melæna, often in the form of "occult blood," is common.

6. *Pyrexia.*—Some rise of temperature was noted in no less than 19 cases of the series—i.e., in nearly one-half. In 11 cases the temperature did not exceed 100° F., in 4 cases it ranged from 100° to 101°; in 3 cases from 101° to 102°; in 1 case it exceeded 102°. Osler noted pyrexia in 74 cases out of 150—a proportion similar to my own. Boas reports a series in which pyrexia was present in 24·6 per cent. Fenwick found that two-thirds of his cases were afebrile. Habershon thinks that a subnormal temperature is the rule.

7. *Examination of the gastric contents.*—In a well-established case of gastric cancer the gastric findings when a test-meal is given, if not absolutely pathognomonic, are often characteristic and suggestive. The usual picture is as follows: (*a*) Evidence of gastric stasis, food being present in the stomach six or seven hours after the last meal; (*b*) free HCl absent or much reduced; (*c*) lactic, butyric and valerianic acids often present; (*d*) occult blood present in the stomach washings; and (*e*) the Oppler-Boas bacillus present.

We need further information as to the gastric findings in early cases of gastric cancer. Too much reliance must not be placed upon the presence or absence of free HCl. Its absence or marked reduction is the rule, but the exceptions are numerous. In a series of 343 cases collected by Moynihan free HCl was absent in 89·7 per cent. Osler records its absence in 84 cases in a series of 94. Dieulafoy attaches much importance to this sign, but gives no figures. In my own series free HCl was absent in 71 per cent. of cases tested. It must be borne in mind that free HCl is absent in many other conditions—e.g., chronic gastritis, gastric fibrosis, pernicious anæmia, and Addison's disease. Free HCl is said to be more frequently present in cases of gastric cancer where simple ulcer has been an antecedent than in cases where this history is wanting. The presence of lactic, butyric, and valerianic acid, and of the Oppler-Boas bacillus is evidence of fermentation, but has not necessarily any further signifiance. Dieulafoy is of opinion that the anachlorhydria of gastric cancer and of chronic gastritis can be distinguished by testing the ferments. Total disappearance of the pepsin and the rennin points to gastritis; disappearance of the pepsin alone points to cancer. The presence of cancer cells in the stomach washings has been reported, but this is unusual, and is improbable in early cases.

8. *Presence of tumour.*—A tumour was detected in 15 cases of my series—37½ per cent. Osler found a tumour in 115 cases out of 150. Brunton held that a tumour could be detected in 80 per cent. of cases at some stage of the disease. Taylor says that a tumour is rarely to be detected during the first three or four months. Its value as a "signal symptom" is not great. Some good authorities hold that when a tumour can be detected the growth is no longer local, and that the time for a radical operation is past. This view is contested by Kocher and by Moynihan.

The seat of the tumour in gastric cancer is variable. It may be felt in the epigastric region, the umbilical region, or in either hypochondrium. It is usually hard, tender, movable, and often nodular. Its mobility varies with its seat. Pyloric tumours are the most movable. The tumour is occasionally visible on inspection.

9. *Complications.*—Enlargement of the liver was noted in 9 cases of the series. Enlargement of the supraclavicular glands was noted in only 1 case. Some observers attach much importance to this sign, and find the enlargement much more frequent on the left side than on the right. Four patients in my series had albumin in the urine. One patient had pyuria. These features were probably accidental. No case of phlegmasia was recorded. Trousseau attached much weight to this complication as a help to diagnosis, and Dieulafoy agrees with this view. Jaundice was not noted in any of my cases. It is rare at an early stage, but may arise when the liver or the pancreas has become involved secondarily.

Let us now consider the general question of the diagnosis of gastric cancer in its earlier stages. The following are the chief points which will repay attention.

A. *History.*—The most usual history, as we have seen, is that of painful dyspepsia setting in sometimes rather abruptly, and without assignable cause, in a patient over 40 years of age whose digestion in most cases has been previously good. In the next most frequent group the early symptoms are those of gastric catarrh. In the third group in point of frequency the early symptoms are those of gradual failure of health, progressive asthenia, loss of weight, with or without important blood changes. Exceptionally, the blood changes arise early and may simulate pernicious anæmia. In a fourth group the history is that of a chronic gastric ulcer which has resisted treatment.

B. *Early symptoms.*—Loss of appetite may be early and marked, and may be the first symptom to attract attention. Oftener it develops gradually. It is usually a prominent feature in established cases, but I have known the appetite to remain good until three months before death. The dyspepsia of gastric cancer has the following features. It is attended by discomfort and pain, sense of fullness in the epigastrium, nausea, sickness, eructations of offensive gases, and in most cases vomiting. These symptoms are at first related to the ingestion of food, but at a later stage they become more or less constant. The vomit is grumous, offensive, and often contains blood, usually in small quantity. The nature of the gastric findings has been already considered. Definite melæna is rare, but "occult blood" is often found in the fæces. In the later stages the dyspepsia is conditioned by disturbance of the gastric motility.

C. *Physical examination.*—In most early cases the results of physical examination will be negative. Tumour and signs of gastric thickening or dilatation belong to the developed disease.

D. *Differential diagnosis.*—In a case of doubt or difficulty the following conditions may require to be differentiated from gastric cancer: (*a*) Chronic gastritis; (*b*) non-malignant gastric ulcer; (*c*) non-malignant pyloric growth; (*d*) pernicious anæmia; (*e*) phthisis.

(*a*) *Chronic gastritis.*—Here the symptoms will probably be of longer duration than in gastric cancer. Some cause for the symptoms, such as dietetic error or alcoholism, will usually be discovered. The loss of weight and the failure of the general health will probably be less marked; anæmia will be absent or slight. Treatment will usually effect speedy improvement.

(*b*) *Non-malignant gastric ulcer.*—This is more common in youth and in the female sex. Pain is more violent, and has a closer relation to the ingestion of food than in gastric cancer. Hæmorrhage is often free; vomiting gives complete temporary relief to pain; hyperchlorhydria is the rule; localised tenderness in the epigastrium is common; the anæmia present is of the chlorotic type. Treatment will bring about speedy improvement.

(*c*) *Non-malignant pyloric growth.*—History, symptoms, constitutional condition, blood conditions, and an examination of the gastric contents may clear these cases up; but, as exploration is now practically free from danger, it may be freely resorted to when an exact diagnosis is urgent.

(*d*) *Pernicious anæmia.*—In those exceptional cases of gastric cancer where a profound anæmia of pernicious type overshadows the gastric symptoms the difficulty of differential diagnosis may be great. The blood examination may be indecisive, though a red blood-count of less than 2,000,000 is rare in gastric cancer, common in pernicious anæmia. None of the figured elements are absolutely pathognomonic of pernicious anæmia. The lemon tint of skin, so characteristic of pernicious anæmia, is not unknown in gastric cancer. Wasting is more marked and more rapid in gastric cancer than in pernicious anæmia. Dyspeptic symptoms will probably be less marked in the latter disease, and a course of arsenic will usually effect marked temporary improvement. It is a useful clinical rule not to make a final diagnosis of pernicious anæmia until we have weighed the possibility of gastric cancer.

(*e*) *Phthisis.*—Very exceptionally, difficulty may arise in the differentiation of incipient phthisis and early gastric cancer. Both diseases may set in with a vague failure of the general health, loss of weight, anæmia, and asthenia, without definite localising symptoms. Dyspepsia is occasionally a prominent feature of incipient phthisis. A mild continuous pyrexia may be present in either disease. But the distinction is rarely difficult. Cough is not long delayed in commencing phthisis; there is usually decided acceleration of the pulse; night sweating or hæmoptysis may supervene; a careful examination of the chest may reveal characteristic signs; family history may give a hint. None of the various tuberculin tests can be relied upon in a doubtful case.

There is no royal road to the diagnosis of early gastric cancer. The difficulties are often great. But a careful review of all the facts of the case, history and symptoms being accorded much weight, and the full utilisation of all modern methods of inquiry will usually enable us to arrive at a sound opinion. Time and the negative results of treatment are the final test.

One interesting question remains for consideration—Is cancer of the stomach on the increase? The Registrar-General's returns show that in 1897 the deaths from cancer of the stomach were: Males, 135 per 1,000,000; females, 123 per 1,000,000. In 1910 the figures were: Males, 185 per 1,000,000; females, 155 per 1,000,000. This represents an enormous increase, but it is a question how far it is real, how far only statistical. The problem of the increase of cancer, like that of the increase of insanity, is very complicated. How far more accurate diagnosis accounts for the increase in the cancer figures, how far the diminished mortality from tuberculosis, and the higher average of longevity react upon the incidence of cancer are questions of great interest upon which we should welcome further information.

Belfast.

ON A SUBSTITUTE FOR PEPTONE AND A STANDARD NUTRIENT MEDIUM FOR BACTERIOLOGICAL PURPOSES.

Report to the Medical Research Committee.

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AND
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EVEN before the war the preparation of a standard broth for bacteriological purposes was a matter of considerable difficulty, since different samples of Witte's and other peptones exhibited such marked variations when employed in nutrient media that the cultural features of an organism were apt to vary with each sample used. Since the cessation of the supply from Germany this trouble has been accentuated, and in work that we have been doing for the Medical Research Committee on the differentiation of the members of the colon-typhoid group we have felt it acutely, because the results obtained when a given sample of peptone is used cannot be repeated with certainty with another sample. This is, in truth, readily explained. "Peptone" is no more than a name which may stand for widely varying substances. Usually it consists of a mixture of proteoses, peptones, and polypeptides which differ enormously both in complexity and amount according to the materials employed, the length of digestion allowed, and the exact method of preparation followed.

Now it is probable that non-proteolytic organisms cannot utilise the higher proteins as food substances and that even the proteolytic organisms grow more readily at first in media which contain an adequate supply of immediately available food material. The nitrogenous substances used by the growing organism are in all probability mainly free amino-acids, together with small amounts of other substances that have not as yet been determined.

In the work that we are conducting we have found a sharp criterion for a standard nutrient medium. If a medium containing a fermentable carbohydrate be sown with a specific organism a definite final hydrogen-ion concentration is reached. This is dependent in a remarkable degree upon the constitution of the fluid, a very slight change in which may cause a considerable variation in acidity. This effect is most clearly seen if more than one organism be employed. In fact, we have often noticed that the degrees of acidity produced by two organisms may actually be inverted.

With these views and facts before us experiments were made with various media containing an abundant supply of these amino-acids. The growth on such media of a large number of pathogenic organisms is so rapid compared with their growth on the recognised standard media that we think it desirable to publish the method of preparation in the hope that it may be of general value as a cheap and effective substitute for peptone and nutrient broths. We also describe a simple method of standardising the reaction of media, the

usual laboratory practice of titrating against litmus or phenolphthalein being extremely unsatisfactory.

The supply of free amino-acids is best obtained by the tryptic digestion of casein, and to procure uniform results a pancreatic extract is used, prepared by a method that has for some time been employed in our laboratory, and which follows a formula given by Mellanby and Woolley. It is true that this preparation is not a standard one, because the proteolytic activity varies in a way that cannot be controlled. We have thought it undesirable to complicate the technique by a preliminary standardisation of the tryptic value of the extract, but with the amounts of ferment and the length of digestion used we think that a sufficient degree of hydrolysis is reached to give practically uniform results.

The details of the preparation of the pancreatic extract, the tryptic broth, and the method of standardisation are as follows:—

Pancreatic extract.—Obtain the fresh pancreas of a pig, free it from fat as far as possible, and weigh. Mince it finely and add three times its weight of distilled water and its own weight of strong alcohol. Shake well in a large bottle and allow it to stand for three days at room temperature, shaking the bottle occasionally. Strain through muslin and filter through a large folded paper. The filtrate, which comes through very slowly, is measured and treated with 1 c.c. of concentrated hydrochloric acid for every litre. This causes the appearance of a cloudy precipitate which settles in a few days and can be filtered off. The fluid keeps for an indefinite period if stoppered, without any additional antiseptic. If desired at once the extract may be used before adding the hydrochloric acid, the function of which is to retard the slow auto-destruction of the trypsin.

Digestion of the casein.—We have tried various commercial preparations, and have finally decided to employ a product made by "Casein, Limited."[1] This is prepared by a standard method yielding a product which in our experience is practically uniform and remarkably free from carbohydrates and free alkali. The firm has consented to supply the material under the name of "Laitproto, No. 6, for bacteriological purposes." To 1 litre of tap-water add 20 gm. of anhydrous sodium carbonate and boil in a 2-litre flask or large evaporating basin. When boiling transfer the vessel to a boiling water-bath and gradually add 200 gm. of the casein. This must be "dusted" in carefully and well stirred to avoid the formation of lumps. Transfer to a Winchester quart and wash out the mixing vessel with a litre of cold tap-water, which is also transferred to the bottle. If necessary, allow the temperature to fall to 40° C. and add 50 c.c. of the pancreatic extract and 15 c.c. of chloroform. Shake well, stopper with a loose cork, and incubate at a temperature of 37° to 40° C., shaking the bottle vigorously each day to break up any lumps. After five days' digestion add another 50 c.c. of the pancreatic extract and allow the mixture to stand for another 10 days—that is, not less than 15 days' digestion in all.

Preparation of the stock broth.—The warm mixture is well shaken to break up any crusts of tyrosine that may have formed, and is transferred to a large (3-litre) flask, treated with 400 c.c. of normal HCl (or 40 c.c. of pure concentrated HCl diluted with 360 c.c. of water) shaken, steamed for 30 minutes, and filtered. The filtrate is treated with 120 c.c. of normal sodium hydroxide and the reaction adjusted.

Preparation of tryptic broth.—The stock broth is diluted with twice its volume of 0·5 per cent. sodium chloride dissolved in tap-water and the reaction is adjusted.

Adjustment of the reaction.—It is now well known that the most significant point in the standardisation of media is a constancy in the hydrogen-ion concentration. This cannot be obtained by the ordinary methods of titration. It may be found accurately by "electric titration," but this method is too complicated for routine work. A very close approximation is reached by following Sörenson's procedure of colorimetric comparison. The principle of this method is that when a given amount of a suitable indicator is added to a given volume of two fluids, the colours produced are identical if the hydrogen-ion concentration of these two fluids is the same. This is subject to certain qualifications, since the colour produced with some indicators is affected by the constituents of the fluid.

For standardisation of the broth a hydrogen-ion concentration was chosen of about $P_H = 7{\cdot}35$ (i.e., a concentration of hydrogen ions per litre of $10^{-7{\cdot}35}$, or $4{\cdot}47 \times 10^{-8}$). This is a reaction very near to that of blood serum and also near the optimum for the growth of most pathogenic organisms.

Our method of standardisation is based on Walpole's[2] principle of eliminating the colour of the broth by use of a special tintometer. This procedure was modified by Hurwitz, Meyer, and Ostenberg.[3] We think we have improved upon their technique and find that our results can be repeated by laboratory assistants having no previous knowledge of the method. Our modification consists in treating two phosphate solutions of a definite hydrogen-ion concentration of $P_H = 7{\cdot}3$ and $7{\cdot}4$ respectively with 1/10 of their volume of a 0·01 per cent. solution of phenol-sulphone-phthalein (the indicator used by the American workers). 5 c.c. of the broth are also treated with 0·5 c.c. of the indicator solution and are then titrated with standard acid or alkali (containing the correct proportion of indicator) until the colour of the broth is intermediate between that of the two standard solutions. Since the broth itself is coloured this has to be compensated for by observing the standard tubes through a layer of broth. We have designed a special holder for the tubes which is shown in the figure. By the use of two standard tubes we find that we can adjust the reaction more exactly than by comparison with the single standard employed by Hurwitz, Meyer, and Ostenberg. Test-tubes of thin clear glass are used, having an external diameter of five-eighths of an inch. These can be obtained from Messrs. Baird and Tatlock, 14, Cross-street, Hatton-garden, London, E.C. ("tubes for colorimetric comparison"). The tube-holder is supplied by Mr. C. H. Nicholl, 1, Mackenzie-road, Cambridge.

The following solutions are required:—

A. *The indicator.*—0·1 gm. of phenol-sulphone-phthalein (which may be obtained from Martindale, 10, New Cavendish-street, London, W.) is transferred to a litre measuring flask and treated with 10 c.c. of N/10 sodium hydroxide and about 500 c.c. of distilled water (previously boiled and cooled). 10 c.c. of N/10 hydrochloric acid are then added and the volume made up to 1 litre with distilled water.

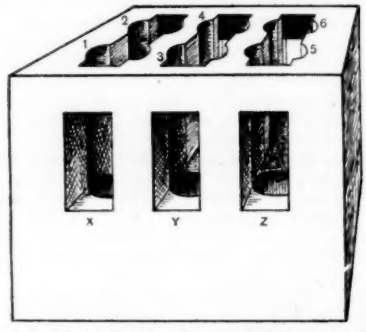
B. *Phosphate mixture* $P_H = 7{\cdot}3$.—Dissolve 9·085 gm. of pure di-sodium phosphate (Na_2HPO_4, $2H_2O$) and 2·133 gm. of pure mono-potassium phosphate (KH_2PO_4, $2H_2O$) in distilled water and make up the volume to 1000 c.c. with freshly boiled distilled water. To 100 c.c. of the phosphate solution add 10 c.c. of solution A, stopper, and keep in the dark.

C. *Phosphate mixture* $P_H = 7{\cdot}4$.—Dissolve 9·596 gm. of di-sodium phosphate and 1·743 gm. of mono-potassium phosphate in distilled water and make up the volume to 1000 c.c. with freshly boiled distilled water. To 100 c.c. of the phosphate solution add 10 c.c. of solution A, stopper, and keep in the dark.

D. *N/20 hydrochloric acid.*—To 1000 c.c. of N/10 HCl (or 100 c.c N.HCl) add 182 c.c. of solution A, and distilled water to make the volume up to 2000 c.c. Keep in the dark.

E. *N/20 sodium hydroxide.*—To 1000 c.c. N/10 NaOH (or 100 c.c of N.NaOH) add 182 c.c. of solution A, and distilled water to make the volume up to 2000 c.c. Keep in the dark.

Six tubes are placed in the holes of the box and to them are added the following solutions:—(2) and (6) Some of the broth.



Stand to hold six test-tubes for colorimetric estimation.

(4) Distilled water. (1) Some of solution B. (5) Some of solution C. (3) 5 c.c. of the broth (accurately measured) and exactly 0·5 c.c. of solution A. (It is essential that the broth for this tube should be boiled for half a minute in a test-tube and well cooled under the tap before it is measured, because subsequent sterilisation causes a change of P_H.) The box is then held up to the light and the tubes examined by looking through the slots X, Y, Z. It will then be noticed that Z is redder than X. It is necessary to adjust the reaction of the broth in 3 so that Y appears to be intermediate in colour between X and Z. If it is redder than Z it must be titrated with the acid solution D. If it is yellower than X it must be titrated with the alkaline solution E.

For the titration microburettes are employed containing 2 c.c. graduated in 1/50 c.c. so that they can be read to 1/100 c.c. The acid or alkali is slowly added to Tube 3 until its colour is judged to be intermediate between the two standard tubes when they are viewed through the box. Should

[1] Casein, Limited, Culvert Works, Battersea, S.W.
[2] Walpole: Biochemical Journal, vol. v., p. 207.
[3] Bulletin of the Johns Hopkins Hospital, Baltimore, vol. xxvii., No. 299, p. 16 (January, 1916).

the titration be performed with the acid solution, allowance has to be made for the change in reaction that occurs from the loss of CO_2 in the subsequent sterilisations. A rough method of overcoming this difficulty is to boil the contents of Tube 3 for 15 seconds, cool thoroughly, and add more acid until the reaction is again correct. This may have to be repeated more than once. Normal hydrochloric and normal sodium hydroxide (and N/10 HCl and N/10 NaOH if the total amount required is expressed in more than two decimal places) is then added to the bulk of the broth, depending on whether acid or alkali was used for the original titration. For every 0·1 c.c. of N/20 acid or alkali required for the titration of 5 c.c., 1 c.c. of normal acid or alkali is added to each litre of the tryptic broth. If special accuracy is required the bulk of the media can be re-standardised after steaming. Sterilisation by steaming on three consecutive days is preferable to autoclaving. The medium is now ready for distribution and use.

We think we can substantiate the following claims for this broth:—

1. It is *very much cheaper than peptone* and is at present about one-fifth the price of 2 per cent. peptone water, not costing more than 1·5*d.* per litre, including the cost of the pancreatic extract, &c., used.

2. It is sufficiently *constant in composition* to yield uniform results.

3. The reaction is constant and can readily be brought to any desired hydrogen-ion concentration, though we suggest that the reaction we have chosen be adopted as a standard suitable for most purposes.

4. On it a *luxuriance of growth* can be obtained with a rapidity that we have not approached with any nutrient peptone. With the colon-typhoid group a very distinct growth can usually be seen in four hours. This luxuriance has not only been observed with the above group but also with B. diphtheriæ and meningococcus (stock cultures). It is at present being tested with B. tuberculosis, gonococcus and other "delicate" organisms. These results, together with those on toxin production, will be published shortly should they prove to be of any value.

5. It is of the utmost use for testing *indol formation* owing to its richness in free tryptophane, the precursor of indol. The indol reaction can be obtained in five hours with B. coli, and after 12 hours a culture of typical strains of such an organism smells strongly of indol. We can recommend the indol test devised by V. E. Nelson,[3] which depends on the orange colour produced by indol in the presence of vanillin and concentrated hydrochloric acid.

6. When diluted with its own volume of 0·5 per cent. sodium chloride it proves an excellent medium for the detection of *acid and gas* formation. At this dilution it is much superior to the ordinary standard medium (2 per cent. peptone water). It is true that the effect is not so marked with organisms that produce acid and gas readily, but it is very evident with those that ferment slowly. For example, we find that we have entirely overcome the difficulty so often experienced in obtaining gas from many strains of paratyphosus A on glucose. Often in cases when no gas is produced on glucose-peptone water the same organism grown in glucose-tryptic broth shows an appreciable amount in about 24 hours, as is clear from the accompanying table. Tryptic broth diluted as above and 2 per cent. peptone water both containing 1 per cent. glucose and litmus as an indicator were the media compared; for gas production small Durham tubes of uniform diameter were employed and the amount of gas in them was measured in millimetres.

Among other sugars investigated were dulcite, mannite, and lævulose, but the above results obtained with glucose are almost identical with those obtained with the other sugars, except that dulcite ferments the slowest.

It was found advisable to dilute the tryptic broth with an equal volume of sodium chloride, because at this dilution acid and gas are more readily produced than in a higher concentration. Our previous work on the final hydrogen-ion concentration reached in glucose solutions leads us to believe that organisms in media containing an abundant supply of nutrient substances will not attack the carbohydrate contained as readily as they will in a medium which is deficient in these substances. A curious fact, however, has been noticed. In the undiluted digest ("stock broth") acid and gas are produced some time later than in the diluted tryptic broth, yet at the end of about 14 hours the amount of gas formed in the stock broth equals that in the dilute broth, and subsequently the gas in the undiluted broth increases out of all proportion to that in other dilutions.

7. The broth is an excellent medium for the preparation of agar, the requisite amount of agar being added to the tryptic broth prepared and standardised as above.

8. Its standard composition also renders it admirably suited to special media, such as Endo, &c.

Table showing Acid and Gas Production on Tryptic Broth and Standard Peptone Water.

Organism.	Broth.	5 hours.		7½ hours.		8½ hours.		10 hours.		12 hours.		24 hours.		48 hours.	
		Acid.	Gas.	Acid.	Gas.	Acid.	Gas.	Acid.	Gas.	Acid.	Gas.	Acid.	Gas.	Acid.	Gas.
B. paratyphosus A 16 ...	Tryptic.	−	0	+	0	++	0	+++	0	+++	3	+++	20		
	Standard.	−	0	−	0	−	0	+	0	+++	0	+++	0	+++	Trace
B. paratyphosus A 17 ...	Tryptic.	−	0	+	0	++	0	+++	0	+++	1	+++	20		
	Standard.	−	0	−	0	−	0	+	0	+++	0	+++	0	+++	0
B. paratyphosus A 48 ...	Tryptic.	+	0	++	0	++	0	+++	1	+++	2	+++	34		
	Standard.	−	0	−	0	−	0	+	0	+++	0	+++	0	+++	Trace
B. paratyphosus B 54 ...	Tryptic.	+	0	++	0	+++	1	+++	4	+++	11	+++	23		
	Standard.	−	0	−	0	−	0	+++	1	+++	1	+++	5		
B. typhosus 40	Tryptic.	−	0	+	0	+++	0	+++	0	+++	0				
	Standard.	−	0	−	0	−	0	+	0	+++	0				
B. coli communis 23 ...	Tryptic.	+	0	+++	5	+++	5	+++	12	+++	19				
	Standard.	−	0	+++	3	+++	5	+++	10	+++	18				
B. coli communior 50 ...	Tryptic.	+	0	+++	4	+++	6	+++	16	+++	22				
	Standard.	−	0	+++	0	+++	7	+++	13	+++	21				

− indicates no change of reaction. + indicates faint acidity. ++ indicates marked acidity. +++ indicates full acidity.
The figures indicate the amount of gas in the Durham tubes, measured in millimetres—e.g., ++, 0 = marked acidity, no gas.

9. There are indications that the restraining power of brilliant green on B. coli is especially selective in this broth, and we hope that the standard properties of the broth will make it possible to adjust it to any given sample of brilliant green once and for all, thus avoiding the necessity of re-standardising for each sample of peptone. This and other points are, however, still under investigation, but we hope to publish the results shortly.

[3] Journal of Biological Chemistry, vol. xxiv., No. 4, April, 1916, p. 527.

LITERARY INTELLIGENCE.—Dr. T. W. Eden and Dr. C. Lockyer, obstetric physicians to Charing Cross Hospital, have just seen through the press a book entitled "Gynæcology for Students and Practitioners." The illustrations, to the number of 500, have been drawn, in most cases, from originals in the Lockyer collection in the museum of the Charing Cross Hospital Medical School. The volume will be published in July by Messrs. J. and A. Churchill.—An anthology, entitled "The Book of Sorrow," compiled by Captain Andrew Macphail, of the Canadian Army Medical Corps, is announced for early publication by the Oxford University Press. In the preface, written in Flanders, Captain Macphail explains that there is ample warrant for completing now a task begun in times of peace, "and offering as a comfort to other hearts what in the outset was designed for private luxury." The volume will be uniform in style with the "Oxford Book of English Verse."

THE SHOCKLESS OPERATION.

BY P. LOCKHART-MUMMERY, F.R.C.S. ENG.,

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SURGERY has at last succeeded in achieving the truly shockless operation, and it has become possible to perform a long and serious operation upon a patient with the certainty that shock will not complicate the procedure. This is a great advance in the history of surgery, one comparable to the achievement of the aseptic operation as the result of Lister's discoveries, although not so important as the latter, since shock is not so dreaded or so common a complication as was sepsis before the discovery of antiseptics. Like the discovery of antisepsis, it is the direct result of the application of principles worked out in the scientific laboratory and subsequently applied in the operating theatre. It is a brilliant result of the application of experimental science to operative surgery—the only true method of progress. Like the discovery of antisepsis, it opens up all sorts of possibilities in the future and removes yet another of the barriers in the way of surgical enterprise. It has now become possible to perform a serious and prolonged operation—such, for instance, as complete excision of the rectum or the removal of a large tumour from the abdominal cavity—without any fear of producing shock, and, in fact, without any disturbance to the patient's general condition, without even increasing the pulse-rate. Further, it is now possible to perform serious operations upon quite elderly people and upon what the insurance companies call "bad risks" with a very considerable degree of confidence.

The ideal method of repairing the human body, were it possible to treat it as a machine, would be to remove the damaged part, such as an eye, a foot, or a hand, repair it under the best and most advantageous conditions, and then reattach it to the body to which it belonged, in the same way as we should do in the case of a motor-car or any other man-made machine. By such a process, repairing the part would not cause any injury or inconvenience to the human body to which it belonged beyond that incidental to the body's being deprived temporarily of the part to be repaired. Unfortunately, this method can never be possible in dealing with the human body, but the shockless operation is the same in principle. The damaged part is isolated from the rest of the human body by local and regional anæsthesia while it is being repaired, and at the same time the patient is kept in a condition of artificial sleep, so that the body, through the brain and special senses, will not be damaged from the psychological influences incidental to the operation which is necessary to repair the damaged part.

In a shockless operation the area of the operation is shut off from the sensorium by means of local anæsthesia. This anæsthesia must be so complete that if the patient were conscious no pain would be felt. Every sensitive tissue is injected with a solution of 1 in 500 novocaine before being divided, or what is better, if it can be done, the main sensory nerve-trunks are injected so as similarly to shut off the desired area.

The operation itself is performed in such a manner as to cause the least possible trauma—that is to say, with light handling and sharp cutting, tearing and blunt dissection being inadmissible. Meanwhile the patient is kept in a condition of artificial sleep by a suitable combination of anæsthetics. First of all, a preliminary injection of morphia (or morphine and scopolamine) is given, the dose of which varies according to the type of patient, and is roughly from 1/8 to 1/3 gr. This should be given an hour before operation, so that the full effects are felt at the time of induction of anæsthesia. Secondly, a general anæsthetic is administered in order to keep the patient quite unconscious. The object of the general anæsthetic, however, is only to produce unconsciousness, and not relaxation or even anæsthesia. The method of combining several forms of anæsthesia was first suggested by Dr. G. W. Crile, who called it "anoci-association"[1] anæsthesia because its object was to cut off from the patient's central nervous system all "noci" (or harmful) impressions. This name, while it may have advantages from a purely scientific point of view, is rather clumsy and has little to recommend it. Nor does there seem any necessity to label this method with a name. It is simply an improved technique by which the shockless operation can be attained.

The best general anæsthetic, in my opinion, is gas and oxygen, ether or chloroform being added if necessary, but only used in very small quantities and for a few minutes at a time, as, for instance to help during the induction of anæsthesia in a very muscular or alcoholic subject, or to tide over a period during which it is necessary to handle some part of the abdominal contents which cannot be properly isolated by local anæsthesia. The form of gas and oxygen anæsthesia which appears to me to give the best results is by re-breathing into a large bag, oxygen and fresh N_2O gas being added as occasion demands. This is the method used by Mr. J. H. Chaldecott, who has given the anæsthetic for most of my cases, and the one with which I have certainly obtained the best results.[2] The total amount of gas used is very small; in one case only three-quarters of a 100-gallon cylinder of nitrous-oxide gas was used in 1 hour and 50 minutes. The patient is kept under the anæsthetic until he is back in bed, and in most cases is conscious in three or four minutes after the mask is removed.

The important point about the general anæsthetic is that instead of the gas or drug being used, as hitherto, to produce anæsthesia, it is only given in sufficient quantity to produce unconsciousness, sometimes hardly that. The ideal condition is the one in which the patient will react to stimuli, will answer if spoken to loudly, or move if hurt. I always ask the anæsthetist to let me know if he sees any sign of stimulation, as this is evidence that the local and regional anæsthesia is not efficient.

Many factors have to be considered before successful results can be obtained. Not the least important is the technique of the surgeon. Those surgeons who tear and separate the tissues with their fingers, and who perform most of the operation by what is called "blunt dissection" can never hope to attain to the really shockless operation. There are some surgeons whose only use for a knife is to cut through the skin, and who perform most of the operation with their hands assisted by blunt instruments. They point, often with pride, to the speed with which they can work and to the small amount of bleeding—advantages, it is true, but obtained at a heavy cost in other respects.

The shockless method of operating involves a somewhat more elaborate technique, and, at first at any rate, takes longer than if a general anæsthetic alone is used. With increased experience in the method the only extra time added on to the operation is that taken up in injecting the local anæsthetic, and should not amount to more than five or ten minutes in a long operation. On the other hand, the shockless method of performing an operation makes the length of time occupied in performing an operation of much less importance, since the amount of general anæsthetic used is relatively much less and shock cannot occur. So far I have seen no harmful results from the injection of novocaine, even though I have often in a big operation used as much as 4 or 5 ounces of a 1–500 solution. No difference can be seen in the tissues at the end of the operation, and the healing of the wound is in no way altered or delayed. The only contra-indications to the method that there would seem to be are in some septic cases where there might be danger of spreading the infection by the injections, and in some cases of cancer where there might be a similar danger of spreading cancer cells. The latter should seldom occur, as no operation for the removal of cancer should ever involve cutting through tissues infected with cancer cells. In any case these objections do not apply if the nerve-trunks are anæsthetised by regional anæsthesia.

The use of urea quinine hydrochloride has certain disadvantages. It may cause an œdema lasting several days, though I believe this is due to the use of too large and too concentrated solutions. Personally, I do not like to inject it into the immediate neighbourhood of the wound.

The advantages of the shockless method of operating are much lighter anæsthesia with, consequently, less probability of subsequent sickness, almost complete absence of post-operative pain, absence of rigidity, and, most important of all, complete absence of shock even after severe and prolonged operations.

[1] Crile and Lower: Anoci-Association, 1914. Crile: Surgical Shock, 1897.

[2] J. H. Chaldecott and C. W. G. Bryan: The Value of Anoci-Association, THE LANCET, Sept. 6th, 1913, p. 721.

The great advantages are more particularly seen in serious operations upon elderly or feeble subjects, and where an operation has to be performed upon an individual who is especially liable to have post-operative vomiting. In any case, the advantages from the patient's point of view are not inconsiderable, and seem to me to be well worth the additional trouble involved in the operative technique. The absence of post-operative vomiting is a very great advantage, as it is impossible to estimate the amount of damage which must often result in abdominal cases from the straining which necessarily accompanies vomiting. Surgeons have become so used to post-anæsthetic vomiting as a necessary evil after operations that they do not worry about it; but they will all agree that it is a most undesirable complication after any abdominal operation. It tends to start hæmorrhage afresh, it makes the stitches cut into the skin, it causes severe pain in the wound, it prevents sleep, it stops digestion, and, in fact, it would be hard to find any other complication which could cause as much damage to the surgeon's handiwork as vomiting. Complete rest for the abdominal cavity is what every surgeon desires for some hours after he has performed a laparotomy, but this is exactly the opposite of what occurs if there is vomiting. Allowing the patient to walk about immediately after an abdominal section would be considered little less than criminal, and yet it could not possibly do as much damage as vomiting.

The following cases are quoted as showing the advantages of this method in special cases.

CASE 1.—A fragile woman, aged 71, was sent to me by her medical attendant on account of a large tumour in the left side of the abdomen which was causing her acute pain. This pain was not relieved effectually by drugs, and she was very anxious to have something done. The tumour, which proved to be a chronic tubercular kidney, occupied the whole of the left side of the abdomen, and after removal was found to weigh nearly 7 lb. The operation was performed by the shockless method, 1/8 gr. of morphia being given before the operation and continuous gas and oxygen used with local and regional anæsthesia. The operation of removing the kidney occupied 50 minutes, for as it was very much fixed by adhesions its removal was quite a difficult matter. Three minutes after cessation of the anæsthetic the patient was quite conscious. She was not sick at all, she had no after-pain, and she was able to have her ordinary tea at 4.30 in the afternoon. Her pulse-rate never altered at all as the result of the operation, and she appeared to suffer no inconvenience in consequence of the operation.

CASE 2.—I first saw the patient, a woman aged 75, with her family physician on account of a large carcinomatous growth situated at the junction of the rectum and sigmoid. She was exceedingly anxious to have this removed if there was any chance of a successful result. A preliminary colotomy was performed, and ten days later the operation was carried out in the same way as in the previous case. The entire rectum, anus, and surrounding skin were removed, together with some inches of the sigmoid flexure. The peritoneal cavity was extensively opened up, and 8 inches of bowel were removed. The operation took 1 hour 50 minutes. The patient was conscious in less than five minutes after being back in bed, and her pulse-rate was only 84. She never caused the slightest anxiety or showed any signs of distress as the result of the operation. She was not sick and did not lose her appetite. She was able to return home in less than a month after the operation.

CASE 3.—A hospital patient, aged 62, was admitted to St. Mark's Hospital with a large growth at the upper end of the rectum, involving the posterior vaginal wall. She was a very fat and flabby subject, and appeared to be a very unsuitable individual for a serious operation. She was operated upon by the same method, the operation taking nearly two hours. She left the operating table with a pulse of 86, was not sick, showed no signs of shock, and caused no anxiety. She was out of bed three weeks after the operation.

CASE 4.—An army officer, aged 52, was sent back to England from a military hospital suffering from carcinoma of the upper part of the rectum, and having just recovered from a serious attack of dysentery. He appeared to be, in the ordinary way, rather a bad risk for an operation. The operation was performed by the shockless method and took about two hours. The pulse-rate was not at all increased, the patient was conscious a few minutes after the operation, and two hours later was propped up in bed reading the newspaper. It was difficult, in fact, to believe that he had undergone a serious operation.

CASE 5.—The patient, a woman aged 73, was operated upon for chronic intestinal obstruction. The operation took 1 hour 15 minutes, and was performed under gas and novocaine anæsthesia. A thorough search of the abdominal cavity was necessary to find the obstruction, which proved to be a band of adhesions (there was considerable distension of all the intestines). The uterus and bladder were stitched up to the anterior abdominal wall to rectify a prolapse. The pulse-rate never went over 84. The patient was not sick, and she recovered without causing a moment's anxiety.

It is my belief that these patients could not have been operated upon successfully in the ordinary way, or at any rate that the risk would have been so great that one would have hesitated to attempt the operation. By the shockless method, however, they were not only able to get through the operation satisfactorily, but they never caused the slightest anxiety, and there was nothing in their general condition a few hours after the operation to indicate that they had undergone an operation. All of them were not only hungry but able to digest their food within 24 hours of the operation.

It must not be supposed that the shockless operation is just a new method which can easily be adopted. It is not so much a method as a series of principles by the careful coördination and coöperation of which the desired result can alone be obtained. The surgeon who wishes to achieve success with the shockless operation must have much patience and take a great deal of trouble to acquire the necessary technique; and he must have an anæsthetist, an assistant, and nurses who understand and are capable of applying the necessary principles.

The credit for the discovery of the shockless operation is due almost entirely to Dr. Crile. Although for more than 12 years I have been working in the same experimental and clinical field I have not had his opportunities, as in this country every difficulty is placed in the way of experimental work instead of its being encouraged as it is in America. In my Hunterian lecture on the Physiology and Treatment of Surgical Shock,[3] published in 1905, I predicted the coming of the truly shockless operation, and Dr. Crile's investigations have now rendered this an actual fact. From 1905 to about 1908 Mr. W. L. Symes and I carried out a number of experiments[4] at the University of London, the object of which was to ascertain what were the important factors in abdominal operations tending to produce shock, and how they might best be combated or avoided. Briefly, we proved that there was a great difference in the shock-producing effects of different kinds of wounds. Whereas wounds made with sharp instruments and accompanied by gentle manipulation, even if extensive, produced very little shock, the exact reverse was found to be the case with wounds produced by blunt dissection and accompanied by rough handling of the tissues. Further, we found that preliminary injection of morphia tended markedly to prevent shock. Our conclusions were never published. Fortunately, similar but much better and more exhaustive experiments on the same lines have been performed by Dr. Crile in America, and his results have been published. It is satisfactory to note that his conclusions are the same as those at which we have arrived, although he has carried his proofs much further than we were able to do. Another result of our experiments was the discovery of the value of extract of the infundibular portion of the pituitary gland in combating shock. Since then this extract has been to some extent standardised, and is one of the most valuable drugs we possess for its effect upon the unstriped muscle-fibre.

My chief excuse for this paper is that the shockless operation does not seem to have received the attention from English surgeons that it deserves. Very few surgeons in this country appear to be using the method at present. Sir Berkeley Moynihan[5] advocates it as a routine method, but still apparently uses ether as the main general anæsthetic. Colonel H. M. W. Gray has also adopted this method, and has advocated it in a recent paper.[6] The present war has interfered very seriously with all advances in surgery which have not a direct bearing upon the treatment of the wounded, and a somewhat elaborate technique, such as is here involved, is doubtless very difficult of application on the field. This is to be regretted, as the condition of seriously wounded men requiring immediate operation is one particularly predisposing to shock.

Hyde Park-place, W.

[3] Lockhart-Mummery: The Physiology and Treatment of Surgical Shock and Collapse, THE LANCET, vol. i., 1905, pp. 696, 776, 846.

[4] Lockhart-Mummery and Symes: Some Points in the Experimental Production and Control of the Vascular Atony of Surgical Shock. Brit. Med. Jour., Sept. 19th, 1908.

[5] Moynihan: Abdominal Operations, 1914.

[6] Gray: General Treatment of Infected Gunshot Wounds, Brit. Med. Jour., Jan. 1st, 1916.

INTESTINAL TOXINS AND THE CIRCULATION.

BY D. T. BARRY, F.R.C.S. ENG., M.D.R.U.I.,
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FOLLOWING up the investigation of the action of excretory toxins on the neuro-muscular mechanism of the heart, I have tried to ascertain approximately the level at which the alimentary toxin begins to be formed.

As in the previous experiments, the toad's heart was perfused through the inferior vena cava, using the intestinal contents, which were mixed with Ringer's solution in a mortar, and the solution rapidly filtered with the aid of a water-pump. Too much filtration with long exposure to the air diminishes rapidly the toxicity of the extract. Dogs and cats which were used for class demonstrations provided the material An attempt was made to remove the toxin by dialysis in a collodion dialyser as recommended by Bigelow,[1] but the dialysate was almost inactive. Most of the cats received in this laboratory suffer from nematode worms, and in these cases, if we get over the difficulty of finding a sufficient quantity of material—the small intestine is almost empty—the toxic effect is slight. The worms, *plus* the contents got by gentle scraping of the gut in these cases, were pounded in a mortar with Ringer's solution.

The effects on the blood pressure and heart beat of intravenous injection of the intestinal contents of the animals themselves were also investigated. A glass tube was tied into the external jugular vein and about 5 c.c. of the extract allowed to run into the circulation, after previous warming to a temperature of 37° C. Prolonged warming, even at low temperatures, diminishes the toxic action.

It is well known that the mucous membrane of the intestine contains depressor substances, extracts made in the preparation of secretin, for instance, showing their presence. Light superficial scraping, however, does not extract them. In the present experiments where the contents were abundant no scraping was necessary, but it was employed very lightly when the contents were sparsely found. Injections of light scrapings have been practised in the investigation of hormones affecting the secretion of intestinal juice, but without marked blood-pressure changes.

Method.

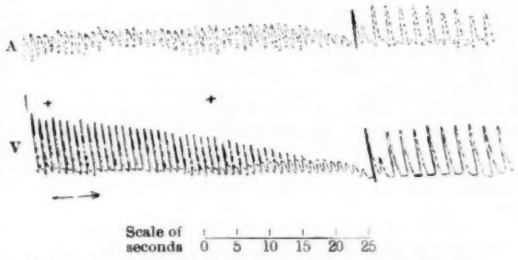
The method employed was to subdivide the small intestine into upper, middle, and lower thirds, of which the contents were mixed with Ringer's solution, 5 gm. in 50 c.c., filtered and neutralised. In the text these extracts are numbered 1, 2, and 3 respectively from above down. The contents of the cæcum were also used and this mixture is numbered 4. In each case the animal is specified, "2 cat," for instance, meaning the contents of the middle third of the cat's intestine.

All the extracts were acid to phenolphthalein and were made neutral by the addition of standard alkali and certain indicators. With these indicators it was estimated, according to the table given by Bayliss,[2] that the H concentration was between 1×10^{-7} and 1×10^{-8} in all extracts used. With phenolphthalein the hydrogen ion concentration is 1×10^{-9} when the colourless solution just changes to pink. A definite pink colour was allowed to develop in the extracts with this indicator by dropping in the alkali, and this was then just dispersed by careful addition of further extract. The solution then gives a faint orange tint with neutral red, and pure red with Congo red.

The glass cannula used in the former experiments was discarded in the present series for a junctional piece consisting of vulcanite. This is of crucial form, the bore being one millimetre throughout. It was made for me by Messrs. Hawksley and Sons. One limb of the junctional piece is attached by rubber tubing to a small glass cannula of which the bore does not exceed one millimetre. The other three limbs are connected with perfusion bottles. This arrangement facilitates washing out and changing of the fluid in one or more bottles without removing the cannula from the vein. The dead space in the combination is almost negligible. The rate of flow was regulated in the manner described in a previous paper.[3] One perfusion bottle always contains Ringer's solution and the other two the material to be examined for toxic effects. The aortæ were cut across to give free exit to the fluid. All the records read from left to right. Tracings of the auricle (upper) and ventricle (lower) are given. Most of the extracts show a toxic action on the muscle or nerves, an effect which is slight in the upper portions of the gut and increases as we proceed downwards. Speaking generally, the varying effects can be interpreted in terms of degree or intensity of action. The most marked action is on the ventricle or on the auriculo-ventricular bundle.

A simple and uniform loss of power in the contractions without change of rhythm (Fig. 1) is sometimes seen, but it

FIG. 1.

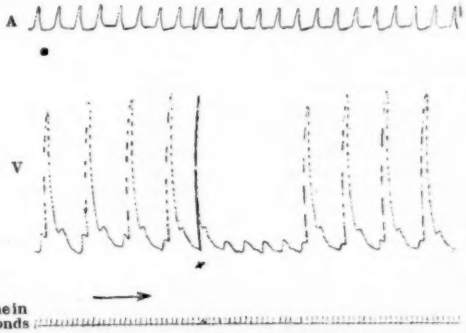


Record of auricular (A) and ventricular (V) contractions of a toad's heart perfused with extract (1) of cat's intestine for the period between the crosses. At the thick line the drum was stopped and Ringer's solution perfused. The record reads from left to right.

is not usual, irregularity of the ventricular beat being one of the most common and prominent features. In the first tracing, 1 (cat), it will be seen that the ventricle fades off in force some time before the auricle is affected and the rhythm is maintained. At the thick line the drum was stopped for a few minutes, during which perfusion with Ringer's solution was carried out. This fully restored the beat, but the rate on recovery was somewhat slower than previously. The accelerator fibres to the heart undergo depression in these cases, as is shown by a stimulus applied to the crescent, which before perfusion gives initial acceleration, but subsequently to perfusion gives none. There is no increased tone, rather the reverse, and the action has to be described as an enfeebling one, especially on the ventricle, with no appearance of block. Further perfusion with the same extract gave similar results. A general consistency of action has been noticed for a particular extract, allowing for the fact that the toxicity tends to disappear with time.

A more common result from No. 1 toxin is a change of rhythm. (Fig. 2.) In the first part of this tracing, 1 (dog),

FIG. 2.



Toad's heart perfused with extract (1) of dog's intestine. Note the 2:1 rhythm. At the point marked with a cross the drum was stopped and extract 2 (dog) substituted. Complete heart-block follows.

only every other beat of the auricles succeeded in sending over an effective stimulus to the ventricles—that is, a 2 to 1 rhythm. At the point marked with a cross the drum was stopped for about half a minute, during which perfusion

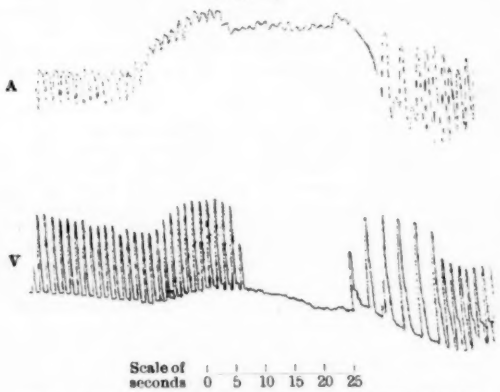
[1] Bigelow and Gemberling, Jour. Amer Chem. Soc., 1907, p. 1576.
[2] Principles of General Physiology, 1915, p. 189.
[3] THE LANCET, May 22nd, 1915, p. 1070.

with No. 2 from the same source (dog) was carried out. The effect of this is seen in complete block of four auricular stimuli. The last few beats of the ventricle before the drum resumed its movement were very feeble. On recovery the previous 2 to 1 rhythm is shown. This is a true example of block and must be due to lowered conductivity of the a.-v. muscle.

No. 3 extract from this source first caused change of normal rhythm to 2 to 1. On continued perfusion for a few minutes it caused tone changes and tremor of the ventricle with slowing of the auricle (ventricle rate). It is only after somewhat prolonged action that the auricular muscle (or nerves) shows any marked effects. Perfusion with Ringer's solution for about one minute (drum stopped) gradually restored the beat, but for some time it remained at 2 to 1.

The effects of No. 4 (dog) mixture were somewhat more pronounced. (Fig. 3.) There is marked increase of tone in the auricles, slight increase in ventricle tone at first, and subsequently block. The arrest is purely ventricular, the auricular contractions, though small in the record, being distinct. The perfusion was stopped when the ventricle was arrested. The quiescent ventricle, of course, tended to keep

FIG. 3.



Toad's heart perfused with extract (4) of dog's intestine. Perfusion was stopped when the ventricle was arrested.

the auricular pressure up, but the increased tone is mostly independent of mechanical pressure effects, although it is relaxed by the relief of pressure with the first few beats restored in the ventricle. Slight changes in perfusion pressure, even if they occurred, could not of themselves cause these effects.

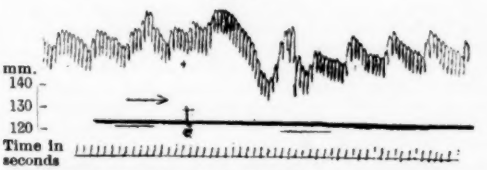
No. 4 (cat), a weak solution, gave in one case increased auricular tone with irregularity which in the ventricle partakes of the character of extra systoles without compensatory pause. There is no block. An increase in calcium ions in the perfusing fluid would cause increased tone changes in the muscle. Calcium, mostly in insoluble form, is excreted by the large intestine. It cannot affect the results to any appreciable extent.

Where the ventricle is arrested as described its irritability and contractility are lost only for a brief period. Except in the early phase of quiescence it responds by contraction to an electrical stimulus. This contraction is single, or the stimulus, if applied late in the quiescent phase, may cause a regular sequence of beats, thus anticipating by a few seconds the spontaneous resumption of the rhythmic contractions. More time is necessary for the recovery of conductivity than for the other properties. The oneness of these properties as maintained by Hering,[4] Muskens,[5] &c., is difficult to credit. Engelmann's[6] view of their independence of one another because ministered to by independent nerve units (bathmo-, ino-, chrono-, and dromotropic filaments) fits in more accurately with common observation, especially of the action of toxic substances.

Intravenous injection.—The animals employed for testing the effects of injection into the circulation were used subsequently for ordinary demonstrations. Complete anæsthesia had to be induced, and a fast of some 12 hours or more preceded the operations; consequently the amount of material to hand in the upper portions of the gut was small, yielding no more than 5 c.c. of a 10 per cent. extract. This was the quantity used throughout.

The records given are from the dog. The blood pressure was recorded by a mercury manometer, either alone (Fig. 4) or in conjunction with a Hürthle tambour (Fig. 5). The advantage of using a Hürthle or some form of sphygmoscope is that it facilitates counting the heart beats, the mercury manometer being unreliable for this. The upper tracing is that of the mercury manometer. A cannula was inserted into the left common carotid artery and made to communicate through a Y-shaped piece with the manometer and

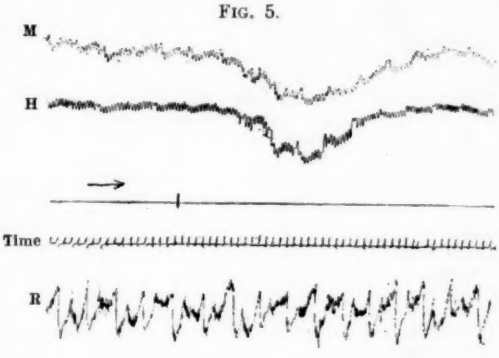
FIG. 4.



Blood-pressure record of a dog taken with a mercury manometer. At the mark on the horizontal line an intravenous injection of its own extract (2) was given.

Hürthle tambour. The pressure was first raised in these after expelling air to about 150 mm. Hg. The breathing is recorded by tambours in Fig. 5. It will be seen that the principal change is a fall in blood pressure, which is slight from the material of the upper and middle reaches of the gut (Fig. 4). The drop in B.P. in this latter case was given by No. 2. The point of injection is marked on the horizontal line; the time record gives seconds. There is very little change in the rate and force of the heart beat. Fig. 5 shows the effect of No. 3 extract injected into the vein, the vagi being cut. With intact vagi there is a fall of pressure soon after the injection at the end of which there is some increase of heart rate and gradual recovery. With vagi cut (Fig. 5) there is also a fall of pressure which is, however, more rapidly recovered from. In this record irregularity of the heart-beat is pretty well shown, and this factor apparently plays a part in the pressure change.

FIG. 5.



Blood-pressure record of vagotomised dog with mercury (M) and Hürthle (H) manometer. The respiration (R) is also recorded. At the mark extract (3) was injected intravenously.

There seems little doubt that substances having a deleterious action on the heart musculature and nerves are formed both in the small and large intestine, even under apparently normal circumstances. It is quite conceivable that such products, whether of bacterial or ferment action, may on occasion exist in excessive quantity and find access by absorption to the circulation; or that certain conditions might determine undue absorption when they exist in ordinary amounts. It is well known that certain products—indol, skatol, &c.—in themselves toxic, are made harmless by oxidation, absorbed and excreted as sulphates. I have remarked in the experiments that undue exposure, overmuch filtering, or delay tends to diminish the action of the intestinal toxins, thus suggesting their volatile nature.

Peptone has a depressing effect on the blood pressure, but practically no peptone is shown to exist in those regions of

[4] Arch. f. d. ges. Phys., Band lxxxvi., p. 533.
[5] Amer. Jour. of Phys., vol. i., 1898.
[6] Arch. f. Phys., 1900, p. 315.

the gut where the toxicity is most marked. If we acidify and boil the contents of the lower end of the ileum, filter, and add alcohol or tannic acid to the filtrate, it gives no appreciable precipitate.

The results of perfusion of the toad's heart give us a much more reliable indication than those of intravenous injection in the mammal. In the latter the quantity injected is small and the time of action short. It is reasonable to assume that prolonged absorption even in minute quantities would produce effects on the mammalian heart similar to those immediately produced in the toad's heart by comparatively strong concentration. The excised mammalian heart may prove suitable for perfusion with more concentrated solutions, but the difficulties of technique would not be light.

Many conditions of irregularity and block observed in the human heart in Stokes-Adams and other affections seem to fall into line with the action of these substances. Osler[7] says that poisons arising in the intestine may cause arrhythmia. Flatulence, he says, may cause it reflexly. A neurotic group of cases is described where no post-mortem lesions are found. In the matter of treatment the same author makes brief reference to dieting and the importance of avoiding full meals and flatulency.

A systematic course of treatment of the alimentary canal antiseptically and otherwise should be of the greatest service in some of these cases. Theoretically there are substantial grounds for the adoption of such a course, the arranging of the practical details of which is, however, in the province of the observant practitioner.

Cork.

KALA-AZAR IN SOLDIERS RETURNING FROM MALTA.

BY GORDON R. WARD, M.D. LOND.,
CAPTAIN, R.A.M.C. (S.R.).

THIS preliminary note is based on two cases which have come under my notice during the last 12 months, and is written with the hope of drawing early attention to the following facts:—

1. That cases of kala-azar are to be expected among men returning from Malta and who have never been farther East than that point.

2. That the diagnosis is likely to be very difficult to those unacquainted with tropical diseases.

3. That the prognosis must not necessarily be regarded as hopeless.

These facts may be well known to those who have had the opportunity of studying tropical medicine, but they deal with a field of study necessarily almost unknown to the average general practitioner, yet it is the general practitioner who is now treating the majority of the returned troops, and there can be little doubt that he will have to practise, after the war, amongst diseases which have hitherto been merely names to him. It is hoped that the writer's experience may be of some assistance to others.

Owing to certain anomalies in the first case and to the fact that the second case is now under treatment no attempt can be made at present to give a full description. The diagnosis and treatment are of first importance, but these must be prefaced by a few more general remarks.

Kala-azar (the "black fever") is well known in India, and until the causal parasite—the Leishmania donovani—was discovered by the R.A.M.C. officers whose name it bears was commonly supposed to be a manifestation of malaria. This fate, of course, has been that of most varieties of splenomegaly in the tropics and even, at one time, at home. Beyond India it has been recognised particularly in the Mediterranean, but here it was chiefly met with in children, and this peculiarity has led some people to suppose that the Mediterranean form is a different disease. However this may be, the course of the disease when it attacks adults seems to be the same as that of the Indian form.

The first symptom is either referable to general enfeeblement or to the splenomegaly and may be weakness, dyspnœa, indigestion, and dragging pain. Diarrhœa is a common symptom and well-marked pyrexia is characteristic. The wasting increases, the skin becomes pigmented, the splenomegaly assumes greater prominence, and the patient dies from exhaustion or from some intercurrent infective process. The duration of the disease may be anything from a few months to some years.

The diagnostic problem is somewhat as follows: A patient presents himself with diarrhœa, continuing weakness, or some similar sign which would fit many disease processes. If no thorough examination is made and symptomatic treatment adopted there will be at the best brief subjective improvement. Eventually examination must be made and will disclose a large—probably a very large—spleen. This will naturally elicit a question as to whether the patient has been abroad and, this being answered in the affirmative, the diagnosis of some tropical disease is suggested. This is the stage at which my first patient arrived. He was sent for examination by his commanding officer with the remark that "he had not seemed fit for duty for two or three months, but had refused to report sick." He was noted to be very anæmic and was admitted to hospital, where the splenomegaly was quickly discovered. The medical officer in charge, who held the Diploma in Tropical Medicine, brought it to my notice with the remark that it was a case of leukæmia. On examination marked general pigmentation was noted. This is against a diagnosis of leukæmia, in which general pigmentation is quite uncommon. A blood examination was made forthwith and revealed a very low leucocyte count. This excluded leukæmia and suggested kala-azar. It did not, however, rule out splenic anæmia. A spleen puncture, however, afforded abundant evidence of the nature of the disease, very many typical parasites being seen.

It is obvious that the conveniences of blood examination and spleen puncture may not always be available, and it is therefore pertinent to inquire how far a definite diagnosis can be arrived at without them. Absolute diagnosis is not possible unless the parasite be found, but the following points in a case of massive splenomegaly are most in favour of kala-azar—viz., residence abroad, general pigmentation, absence of enlarged glands, deafness and failing sight (all of which may be found in leukæmia), and the temperature. The latter is peculiar in showing two daily rises, and a four-hourly chart is necessary to show this. The first maximum is reached about noon, the second in the evening.

My second case was admitted to hospital after three or four months of increasing debility. He complained mostly of diarrhœa. When only a few days' temperature readings were available they closely resembled a somewhat typical enteric defervescence. The diarrhœa and splenomegaly were held to be consistent with such a diagnosis, although the extent of the latter was felt to be unusual and disquieting. Major A. Elliot, of the 1st London Field Ambulance, has kindly given me details of another case (also contracted in Malta) in which the same diagnosis was arrived at. It is therefore very important to remember that the splenomegaly of enteric is not nearly so marked as in kala-azar and is not solid to the feel. A hard, massive spleen extending to the umbilicus or to the pubis can never be ascribed to typhoid, nor indeed is it likely to be associated with anything like so acute a process as any of the enteric group. In the second case spleen puncture was performed to place the diagnosis beyond doubt, although reasonably definite parasites were found in the circulating blood.

One other point may be mentioned in diagnosis. The idea that kala-azar was malarial, amongst other factors, gave rise to a very firmly rooted conviction that malaria could produce extreme chronic splenomegaly. Whether this is now held to be the case the writer does not know, but it is significant that Castellani and Chalmers, in their "Manual of Tropical Medicine," give "marked enlargement of the spleen" as a diagnostic point in favour of kala-azar as against malaria. No other authority is immediately available for reference.

As regards prognosis, the same writers are distinctly pessimistic, stating that 70 per cent. die with vigorous quinine treatment and 98 per cent. without this. The first case mentioned recovered after taking from 60 to 70 grains of quinine daily by the mouth for three months. He has been on full duty for five months since. The second case is now taking 60 grains daily (reached by increments of 6 to 9 grains a day) and there is some slight diminution of the splenomegaly, but his general condition is not improved. He has not been long under observation.[1] Major Elliot informs me that the case he saw did not have any large doses of quinine and died eventually of cancrum oris. In any case, it is

[7] Text-book of Medicine, 1912, p. 774

[1] This patient has since died.

obvious that quinine ought to be pushed as much as possible. In neither of my cases did large doses give rise to manifestations of quinine poisoning sufficient to annoy the patient, but when this is the case bromides are said to mitigate the symptoms.

More recently Sir Leonard Rogers and others have used intravenous injections of 2 per cent. tartar emetic in saline, and claim to have better results than by the older methods. The details of technique can be found in sundry papers published in the medical journals during the last year or two.

In conclusion, it may be stated that this note will have achieved its object if the general practitioner, to whom it is addressed, will think of the possibility of kala-azar in the presence of splenomegaly in a soldier returned from abroad. There can be no doubt that the greatest difficulty in diagnosis is the realisation of what the disease may possibly be. Once kala-azar is considered as a possibility the diagnosis presents no particular difficulty.

Sevenoaks, Kent.

ABDOMINO-PERINEAL RESECTION OF RECTUM BY COFFEY'S MODIFICATION OF THE TWO-STAGE OPERATION.

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SURGEON TO THE ROYAL CORNWALL INFIRMARY, TRURO.

THE radical operation for cancer of the rectum as elaborated by Ernest Miles[1] must necessarily be a most serious surgical procedure, for even in his very skilled hands it takes from an hour and a half to two hours to perform, and the mortality reaches 22 per cent., other surgeons admitting a much higher figure. Apart from the grave injury necessarily inflicted on the tissues, the mere duration of anæsthesia for such a prolonged period is serious, and this danger is enhanced by the change in position of the patient required for the performance of the perineal portion of the operation. It is not surprising, therefore, that various plans have been suggested for dividing the operation so that it may be performed in two stages, the abdominal portion constituting the first and the perineal the second stage.

W. Mayo[2] expresses the opinion that by operating in two stages the mortality may be reduced to one-half of that occurring when it is performed in one. He suggests two plans for the division: the first to perform a colostomy without division of the bowel, followed by Kraske's sacral operation or some modification of it. This has the advantage that it can be employed in cases of obstruction and allows of cleansing the lower and diseased segment, but beyond the fact that it permits exploration for metastases it has none of the advantages of the accepted abdomino-perineal operation, but is really a modification of Kraske's operation. The second method, of which several modifications may here be considered, is that usually adopted. It consists of a first stage at which the pelvic colon is divided and the ends closed, the lower end of the upper segment being brought through the abdominal wall as a permanent colostomy, while the lower segment is freed from its attachments and left to be removed by a perineal operation as a second stage.

In the treatment of the separated lower segment with its attached mesentery and glands several plans have been proposed. Mayo, leaving the lateral attachments of the rectum in the pelvis intact in order to preserve the middle hæmorrhoidal arteries, pushes the whole mass into the lower part of the pelvis and closes the peritoneum over it, leaving it thus until it is removed in the second stage (perineal) operation, six or seven days later. In one case of Mayo's and in several elsewhere recorded the blood-supply has proved insufficient, and perforation of the bowel has led to a fatal result. Another method which he has tried is to divide the bowel with the cautery between clamps, the lower clamp being left in the wound surrounded by a thin rubber tube packed with gauze. Alternatively the bowel may be divided between ligatures,[3] the end inverted with a purse-string suture, and the peritoneum sewn over it to protect the peritoneal cavity. The danger of sepsis in thus dividing the gut low down in the pelvis in the presence of a sloughing growth is obvious and seems to constitute a very serious disadvantage to the plan. As a further alternative it has been suggested by Coffey[4] that the lower segment should be inverted through the anus, which prevents any danger of sepsis to the peritoneal cavity since the bowel is not opened. The peritoneal surfaces which are in contact rapidly close the upper end so that when necrosis from loss of blood-supply occurs, there is no longer any avenue open to the pelvic cavity. With these advantages it has, of course, certain limitations; thus, in the case of a large mass of growth it may be technically impossible to perform the inversion and get it through the anus. Another difficulty occurs where the growth actually involves the region of the anterior reflexion of the peritoneum from the rectum, but this, if sufficiently extended, must render any two-stage operation upon these lines nugatory and that to a greater extent in the other modifications than in this.

As some plan of invagination had for some time seemed to me more hopeful than anything previously described, I at once adopted Coffey's method in the following case which came under my care, and it proved entirely satisfactory.

Mrs. ——, aged 49 years, was sent to me in October, 1915, with a view to operation for cancer of the rectum. She had been suffering for two years from symptoms due chiefly to a polypus which came down every time the bowels acted and bled fairly freely until it was replaced in the rectum. There was also an offensive discharge, but no obstruction and no pain which did not seem easily accounted for by the polypus. She had not appreciably lost flesh, and when seen she was well nourished and not more out of health than might be expected from the constant irritation and discharge. On examination a polypus of about the size of a plum was found attached by a thin pedicle to the anterior wall of the rectum just inside the anus. Some two inches above the anus a soft granular growth was felt, apparently encircling the bowel and reaching upwards as far as the finger could reach. The lower part was but little raised, while the upper part protruded into the lumen of the bowel. Nowhere could any fixation of the rectum be made out; the vagina was normal and the uterus freely movable. The liver was not enlarged, and nowhere could any glandular or metastatic deposit be felt.

As the case seemed suitable for operation the patient went to a nursing home, and on the night of her arrival the polypus came down and the opportunity was taken to remove it so that the rectum could be better cleared. The first operation was performed two days later. An incision was made from the umbilicus to the pubes in the middle line, and a preliminary examination made which showed the absence of recognisable metastasis. The pelvic colon was drawn out of the wound and a point selected in its lower part so that as much as possible might remain to form a reservoir for fæces. At this point the bowel was crushed and divided with the cautery between ligatures, the divided end being turned in and closed with a purse-string suture. The mesentery was then divided back to the promontory of the sacrum and the superior hæmorrhoidal artery ligatured. The peritoneum was divided on either side of the rectum down to the base of the broad ligament and the whole mass of rectum with the soft tissues and glands separated from the sacrum as far as the upper end of the coccyx. The anterior reflexion of peritoneum from the rectum was divided, and finally the lateral attachments of the rectum. The portion of gut below the section with its adherent cellular tissue and glands had thus been entirely freed down to a point a little below the anterior reflexion of the peritoneum. A large rubber tube had been prepared, shaped, and stitched so as to form a blunt point at one end and open at the other, and to act as a pilot for this a corresponding glass tube closed and rounded at one end. This tube with its pilot in position was now passed by an assistant through the anus and up the rectum, the end of the tube being guided by the operator's hand in the pelvis. When it was well in the rectum the glass tube was withdrawn and the rubber tube pushed on until it reached the closed end of the bowel. Here it was firmly fixed by stitches passing right through the gut and rubber from side to side. The tube was then slowly withdrawn, invaginating the upper end of the bowel into itself, the walls being meanwhile supported by forceps on each side. This was continued until the whole of the free portion had been invaginated. The cut edges of the peritoneum in the pelvis were drawn together with stitches, and in order to form a second peritoneal layer the uterus was drawn back and stitched to the peritoneum over the sacrum and laterally, the peritoneal floor being thus firmly closed. The lower end of the upper segment was then

[1] E. Miles: British Journal of Surgery, October, 1914 (full description of his operation).
[2] W. Mayo: Annals of Surgery, August, 1912.
[3] E. Deanesly: Brit. Med. Jour., vol. i., 1910, p. 1145.
[4] R. Coffey: Annals of Surgery, April, 1915.

passed through the left rectus by means of a separate incision and fixed to form a permanent colostomy, and finally the main wound sewn up.

The operation lasted one and a half hours, but the patient bore it extremely well, the pulse not exceeding 100. Next day, however, there was a good deal of discomfort from distension, which necessitated the opening of the colostomy in 48 hours after the operation. After this her recovery was rapid, there was no trouble from the necrosed bowel, which separated off on the sixth day, the temperature did not exceed 100·2° F., and in 14 days she appeared quite fit for the second operation, the wound being quite healed and the colostomy acting well.

At the second operation, with the patient in the extreme lithotomy position, a lozenge-shaped incision was made round the anus and carried backwards to the sacrum. The coccyx was removed, the sacro-rectal space opened, and the dissection carried upwards until the closed upper end of the rectum was reached. Unfortunately the peritoneal adhesions at the invagination gave way during this manipulation, and septic material from the interior of the rectum escaped into the wound. This was sponged away and the opening closed as well as possible with a gauze pad while the lateral and anterior connexions of the rectum were separated. This was accomplished without much difficulty and the rectum and anus removed. There was some oozing from the deep part of the wound which caused delay. When this had been stopped the edges were sewn together and a large tube left in the sacral end of the wound.

There was a good deal of shock from this operation, which lasted one hour, the pulse rising to 132, due in part, no doubt, to the oozing above mentioned, but chiefly, it seemed, to the anæsthetic, which on this occasion the patient took very badly. The shock, however, soon passed off, the pulse falling to 112 in a few hours, and after this she made a perfectly satisfactory and uneventful recovery. The wound, though necessarily septic owing to the escape of the contents of the rectum, gave no trouble, and almost the whole of the anterior part had united when the stitches were removed on the seventh day. The posterior portion where the tube had been healed more slowly and was not closed until six weeks after the second operation, when the patient returned home. The colostomy was then acting once a day, and required nothing more than a simple pad. The latest information is that she is doing extremely well.

The portion of the bowel removed showed a soft carcinomatous growth about 4 inches long, commencing 2½ inches from the anus, and nearly encircling the rectum. The upper limit of the growth was about ¾ inch below the level at which the invaginated portion had separated off.

From the satisfactory result obtained in this case it seems reasonable to conclude that Coffey's suggestion is of distinct value and likely to prove useful in suitable cases.

Truro.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

ASPHYXIA FROM DEFECTIVE SHIP-BOARD VENTILATION.

BY GILBERT E. BROOKE, L.R.C.P. & S. EDIN, D.P.H.,
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FATAL accidents take place from time to time on board ship as a result of faulty or imperfect ventilation. Generally speaking, these accidents are the result of poisonous and explosive gases from consignments of cargo, as, for instance, ferro-silicon, which when acted on by moisture evolves phosphoretted hydrogen, often accompanied by arseniuretted hydrogen. A number of examples of shipping fatalities from this cause will be found in a special report on the subject issued by the Local Government Board in 1909 (Cd. 4958). Occasionally, however, in the absence of proper ventilation, changes in the normal oxygen and carbon dioxide air content, brought about in various ways, may result in serious mishaps. As far as my experience goes these changes are of two types. A condition may arise in which some of the oxygen in a compartment is used up, while the normal CO_2 content is unchanged; while, on the other hand, the amount of CO_2 may be much increased at the expense of the existing oxygen.

The first of these two types is, of course, the least dangerous. The following is a good example of it:—

An empty oil-tank ship arrived in Singapore. Her after-cofferdam had been filled with Suez water, most of which had been used, and the compartment had been battened down for about a month. When the compartment was first opened several men who attempted to enter became unconscious. After being rescued and removed to the fresh air they all recovered without further mishap. An analysis of air in the compartment showed that there was no petroleum vapour and that the CO_2 was normal. The oxygen, however, had fallen to 15·4 per cent. The result was therefore merely an oxygen starvation, which, if not too long continued, could be easily recovered from. The only reasonable cause which could be discovered for the condition was a process of rapid oxidation of the bulkhead ironwork (in the presence of closure, heat, and moisture), leading to a large abstraction of oxygen without other chemical action.

With regard to the second type mentioned above, two cases have come to my notice, both of which were attended with fatal results.

A ship named the *Merapi* arrived from China on April 28th, 1908. When her lower holds were opened up for the removal of cargo two of the ship's crew who attempted to enter the hold fell down insensible. They were removed after a little time, but artificial respiration was tried without success. On analysis the air of the hold showed oxygen 8·6 per cent. and CO_2 11·8 per cent. I was on leave at the time, and could, unfortunately, get no particulars as to the ventilation of the compartment nor the composition of the cargo.

The second case was a still more remarkable one. A Dutch steamer, the s.s. *Jacob*, arrived in Singapore on Dec. 22nd, 1915, with general cargo from Amoy and Swatow and 1826 'tween-deck coolie passengers. The passengers were all healthy on arrival and were given pratique at the quarantine anchorage. The ship then proceeded to the inner roads to discharge her cargo. This cargo had been battened down in the lower holds for six days of a tropical voyage. On opening one of the for'ard holds (No. 2) two of the Chinese crew descended, but immediately fell insensible on the top of the cargo. All attempts to bring them up were unsuccessful, until the hatch cover had been removed for some ten minutes. The men were then apparently dead. Artificial respiration was continued for some time, but without avail. Spaces between cargo-bales enabled me to obtain a sample of air from near the limber-boards, which, on subsequent analysis, disclosed the following remarkable figures: Carbon dioxide, 22·55 per cent.; oxygen, 1·86 per cent.; marsh gas, 0·30 per cent.; nitrogen, 75·29 per cent. When the hold had been properly aired after an hour or two I was able to go down and make a survey. The air was hot, slightly aromatic but disagreeably acrid. There had been originally two ventilators communicating with that hold. The for'ard one traversed the 'tween-deck intact and ended as a six-foot shaft above the main deck. This shaft was fitted with a fixed mushroom top, and could therefore at best only act as an uptake, but would have no action at all in the absence of other ventilating openings or intakes. The second ventilator was situated aft, and, like the first, traversed the 'tween-deck intact, but was then diverted in square section through some cabins and was supposed to open on the upper boat deck. The opening, had, however, been permanently decked over, seemingly for a long time. There had therefore been a condition of air stasis for six or seven days in a hold three-quarters full of cargo, and at a temperature probably increased by "wild-heat" to over 90° F.

Under such circumstances the composition of the cargo was the important question. A few sacks of soy beans, sugar, and cooked rice comprised the smaller portion. There were also 277 baskets of garlic and over 1000 large wooden tubs of fresh oranges. The rest of the space was occupied with bales of Chinese paper and baskets of fowls eggs. The replacement of all the oxygen by carbon dioxide must have been brought about by respiration of the oranges and garlic in the absence of any ventilation; and the high temperature was probably a contributing factor of importance.

Singapore.

A CASE OF ADVANCED INTRA-ABDOMINAL PREGNANCY.

BY B. RANDALL VICKERS, M.B., B.S. LOND.,
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IN view of the rarity of abdominal pregnancy continuing to the later months, it is worth while recording the following case recently treated in Wuchow, Kwangsi Province, China.

The patient, a boatwoman, aged 39, appeared at the clinic on Nov. 23rd, 1915, complaining of a lump in the abdomen

and giving the following history: Fever and chills in the fourth moon; swelling of abdomen began a month ago; occasional pain in the abdomen; bowels open daily with hard stools. Menstrual history: Had had two children, 20 and 19 years ago; no pregnancy since then. The menses were regular until the third moon of this year (April–May), then nothing until the sixth moon (July), when the flow appeared twice. The same happened in the seventh moon, since when nothing up to date. Premenstrual pain for about a year, no leucorrhœa.

Abdominal examination.—A visible tumour in the lower abdomen, roughly median in position. Faint linea nigra present, also a number of cautery marks in the left iliac region, which part she said was the most painful. The tumour came up from the pelvis, was irregular, movable, and very hard, manipulation causing more or less pain. Percussion dull; splenic area resonant. The upper limit of the mass was about at the level of the umbilicus, and an "edge" was palpable to the left of this.

Vaginal examination.—Great hypertrophy of lips of cervix, which was very soft. There was a knob in Douglas's pouch, very hard, and connected with the abdominal lump. The uterine sound passed from 4½ to 5 inches. The main mass seemed to be behind the uterus, which was deflected towards the right side.

The patient was admitted to hospital on Nov. 29th, 1915. After admission she had a good deal of pain in the tumour, and six days subsequently began to have a pale bloody discharge from the vagina (? menses). On Dec. 7th she passed three fleshy "clots," one of which I saw, 1½ in. square and ½ in. thick, not unlike decidual membrane. On Dec. 8th this note was made: "On examination of the abdomen this morning I noticed immediately that the mass was moving inside in a manner suggestive of vigorous fœtal movements. These continued incessantly, and further examination showed that the irregularities of the tumour might well be fœtal small parts. Careful auscultation revealed a fœtal heart beating at 168 per minute, heard in the left iliac region immediately above and external to the innermost of the cautery marks. Patient says the tumour has been moving for over a month, and the movements are accompanied by pain." Dec. 10th: "Upper part of tumour is to-day well above umbilicus. Cannot define it well because of the tenderness, and cannot make out the placental mass."

On Dec. 10th, with the assistance of Dr. Hayes, I operated, Dr. Leavell giving the chloroform. An incision 5 in. long was made in the middle line above and below the umbilicus. As soon as the peritoneum was incised the intestines and omentum presented, and a certain quantity of yellowish fluid escaped. The intestines had lost their gloss and were studded in parts with little nodules from a chronic peritonitis; they were not matted together, though here and there flakes of lymph were seen. While the bowel was being replaced a loop of umbilical cord extruded itself from the lower end of the wound. On holding apart the abdominal wall the child was visible and was extracted without much difficulty, the head causing a little delay as compared with other parts. The position was dorso-anterior, with the feet in the right false pelvis and the head up in the direction of the spleen. The child was not in any sac, but the head was enclosed in a pouch which seemed to grasp its neck and caused a moment's delay in delivery, though there was no definite membrane found. The cord, having been clipped and severed, was traced into the placenta, which was found to be large and attached to the right side of the pelvis and the posterior surface of the uterus. In view of the risk of serious hæmorrhage from the placental sinuses it was decided to remove the uterus and appendages *en masse* with the attached placenta. As the uterus had also a myoma this proceeding was less undesirable than it might otherwise have been. Supravaginal amputation was therefore performed with the removal of the right appendages and left tube, the left ovary being left *in situ*. Considerable hæmorrhage was encountered from the placental vessels, as the tissues were more friable than is the case with normal intra-uterine placenta. As the patient had lost a good deal of blood and the general condition was dangerous, no attempt was made to unite the opening in the posterior parietal peritoneum. This was because the previous manipulations in this area had led to much bleeding, and it was feared that the introduction of the needle for stitching might restart the trouble. A tube and gauze drain were left down to the bare area, and the anterior abdominal wall was closed. The operation took exactly three hours, and at its close the patient's pulse had recovered somewhat, being fairly strong at 116 per minute. The child was covered on its back, shoulders, and arms with lanugo, being apparently about eight months old. It was revived after delivery and lived a few hours. Sex, female. On examination of the extirpated uterus, &c., it was found that the right tube could be traced for a distance of about one inch, and was then lost on the placenta. The placental attachments to the womb's posterior surface were of such a nature that they could have been broken down without severe hæmorrhage, but previous to the removal it was impossible to know this. The uterine cavity contained a ragged decidua, and in its anterior wall was an interstitial myoma of the size of a walnut. The right ovary was enlarged. It is noteworthy that this child was to all intents free in the peritoneum without any enclosing sac of amnion and not surrounded by any appreciable amount of fluid.

Thirty-six hours after operation the temperature rose to 103·2° F. This was not surprising in view of the manipulations and the large bare area. By proctoclysis and hypodermoclysis, however, the danger was averted, and the untoward symptoms gradually disappeared. The subsequent progress was good, but complete closure was delayed by the infection of some deep ligatures which necessitated continued drainage. Ultimately the patient left the hospital completely well on Jan. 27th, 1916. (It was interesting that on Dec. 24th to 27th the breasts became enlarged and knotty, with secretion of a watery milk.)

Reconstructing the history of this morbid condition, it appears that the patient became pregnant about the third moon, the pregnancy occurring in the right tube. Amenorrhœa followed, but by the sixth moon the sac had grown large enough to require more space, and ruptured the tube; this was accompanied by uterine hæmorrhage. The internal hæmorrhage was not very severe, and though the sac itself was ruptured that part of the chorion which was destined to form the placenta was not damaged sufficiently to overcome its vitality. The embryo continued to grow, the placenta forming around the site of rupture.

The fœtus was in the nature of a foreign body free in the peritoneal cavity and set up a chronic low peritonitis, as evidenced (1) pathologically, by the granular intestinal peritoneum and free peritonitic fluid, and (2) clinically, by the tenderness on palpation and pain on fœtal movements. (There is no reason to suppose that intraperitoneal fœtal movements, apart from inflammation, would of themselves cause pain, any more than the physiological movements of intestinal loops cause pain in normal individuals.)

The irregular hæmorrhage in the sixth and seventh moons is thus accounted for. The passage of decidua while in hospital may not unreasonably be attributed to the exploration by sound a few days previously. In fact, it seems as if a "labour" had supervened, but that the placental circulation had not immediately ceased, as is usually the case.

The question which I have not been able to solve is, Why should the fœtal movements have varied so greatly at different times? When I saw the patient in the dispensary and again in the hospital abdominal inspection and palpation aroused no suspicion, but on Dec. 8th the moment the abdomen was uncovered one could not help seeing the furious "kickings" continually going on; and yet, having seen and felt them, the next day in prolonged palpation I failed to detect any movement whatever, though the event proved that the child was not dead.

Wuchow, South China.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Exhibition of Case and Specimens.—Hæmatoma of the Abdominal Wall.—Abdominal Pregnancy.—Acute Hepatic Toxæmias Complicating Pregnancy and Labour.

A MEETING of this section was held on June 8th, Dr. M. HANDFIELD-JONES, the President, being in the chair.

Mr. JOHN D. MALCOLM showed a case of Strangulation of the Uterus by Torsion of the Body on the Cervix. While rotation of the whole uterus with an ovarian or uterine tumour is not very uncommon, the displacement being at most something over half a revolution, Mr. Malcolm stated that he had never seen complete arrest of the blood-supply from this cause. The patient was a rather frail woman, aged 70, married, but never pregnant, who on Nov. 3rd complained after dinner of pelvic pain. Next morning she was better and took her breakfast in bed as usual. She could not get up afterwards because the pain became so intense, and it was then accompanied by vomiting. Towards evening the temperature rose to 101° F. That night a hard, round pelvic tumour was found median in position, and about 4 inches in diameter. Behind this and also in

the middle line lay an elongated irregularly-oval mass, measuring apparently about 3½ inches from above downwards by 1½ inches from side to side. This was fairly soft but of uneven consistence. It seemed to be attached to the hard mass in front, and there was a soft short cervix uteri below. The rectum was firmly compressed, but the abnormal parts seemed to be slightly movable as one mass in the pelvis. They were very tender and therefore seemed larger and more fixed than they really were. It was known that a fibromyoma existed before the patient's menstruation ceased, and it was easy to surmise that something had twisted. On opening the abdomen a fibromyoma was seen attached to the left anterior upper part of the uterus. This and the uterine body had revolved one full turn on the cervix, the lower end of the body being so tightly twisted that the parts above were of a deep blue-black colour, and although it was only 16 hours after the pain became severe and about 28 from its first onset, the conditions caused a distinctly offensive odour. Supracervical hysterectomy was performed, and the left ovary and Fallopian tube, which were raised by the new growth above the constriction, were taken away. The right ovary and the greater part of its tube were below the constriction and were not removed. Considerable trouble from flatulent distension followed the operation, but otherwise recovery was good although slow. The specimen exhibited by Mr. Malcolm showed a uterine body as big as that of a woman in the prime of life, but enlarged by congestion. The softness of its tissue, due to senility, evidently facilitated the attenuation necessary to make it sufficiently narrow to become strangulated by torsion.—Dr. CUTHBERT LOCKYER referred to the following cases of acute torsion:—1. Poth's case shown in Berlin in May, 1913. The patient was aged 56. She had suffered from severe abdominal pain for 21 years, and was known to have a large abdominal tumour. The abdomen contained blood-stained fluid. A pedunculated subserous myoma with a twisted pedicle was removed, and then the uterus itself was found to be twisted upon its neck through 360 degrees from left to right. 2. In August, 1914, Dr. T. W. Eden and Dr. Lockyer operated on a case in which a similar condition was discovered. The large myomatous uterus was blue-black in colour, and both appendages were engorged with blood and thrombotic. 3. Steinbuchel's case, in which severe internal hæmorrhage resulted from rupture of one of the vessels which was severed during torsion of the pedicle. 4. Grunert's case, where a moderate degree of torsion of the uterine body (90 degrees) led to very acute symptoms simulating the acute torsion of an ovarian cyst. 5. Jolly's case, in which a torsioned myomatous uterus became impacted in the pelvis and led to displacement and blocking of the ureters, double surgical kidney, and death from uræmia. Dr. Lockyer thought that the causation of torsion of the uterine body was still a subject for speculation. When, as in Poth's case, the pedicle of a large myomatous uterus became twisted it was not difficult to understand that a small uterine body lying below might share in the process, especially since it is acknowledged that once torsion has taken place it is apt to be progressive. In a case like Mr. Malcolm's, where the tumour had a wide attachment to the uterus, it must be assumed that in trying to rise out of the pelvis it met with resistance, to overcome which rotation of the tumour and of the uterine body was brought into play. The fact that these cases occurred in women over 50 years of age was noteworthy.

Dr. F. J. MCCANN showed: (1) A specimen of Pregnancy in a Large Fibromyomatous Uterus; and (2) a specimen of Soft Fibroma of the Vaginal Wall.

Dr. H. RUSSELL ANDREWS read a short communication on three cases of Hæmatoma of the Abdominal Wall. 1. A patient eight months pregnant was admitted to the London Hospital very ill, with pulse-rate 135 per minute, temperature 101° F. at night, respirations 28–36 per minute, with severe cough and much dyspnœa. The pregnant uterus was felt in the left half of the abdomen, while the right half was filled by a large, exquisitely tender, tumour. A premature stillborn child was born 30 hours after admission. The patient's general condition was such as to contra-indicate abdominal section until several days after her admission. A diagnosis of ovarian cyst, with localised peritonitis, was made. At the operation the tumour was found to be a hæmatoma containing nearly 2 lb. of blood between the right transversalis muscle and the transversalis fascia. 2. A patient was sent into the London Hospital with a diagnosis of twisted ovarian tumour. For two weeks she had had a painful swelling in the left side of the abdomen after carrying a pair of steps upstairs. Dr. Andrews made a diagnosis of hæmorrhage into, or round, a desmoid tumour in the left rectus. The tumour proved to be a hæmatoma in the left rectus muscle spreading out a short distance between the transversalis muscle and the transversalis fascia. 3. A patient under the care of the late Dr. Maxwell had a painful swelling on the left side of the abdomen, which had appeared a week previously with coughing. This swelling was found to be a hæmatoma, which had apparently originated between the left rectus and tracked outwards. Dr. Andrews referred to four previously recorded cases of hæmatoma of the abdominal wall. Four of the seven patients were pregnant, and four complained of cough.—The PRESIDENT thought that these cases must be very rare, as he had seen only one instance during a somewhat long experience.—Mr. MALCOLM and Dr. AMAND ROUTH had also each seen one case, the latter in a woman who had for some time had a small umbilical hernia, the ring of which suddenly gave way during a sudden effort, and hæmorrhage took place below the protruding bowel.

Dr. MCCANN read a short communication on a case of Abdominal Pregnancy, probably Primary.

Dr. JOHN PHILLIPS read a paper on Acute Hepatic Toxæmias Complicating Pregnancy and Labour. In bringing the subject forward for discussion he noted that no previous consideration of this complication of pregnancy and labour had ever taken place before this society. He related five cases arising in just over 2000 carefully recorded cases of labour in private practice which presented many similar features and which could be placed in one group. Many of the symptoms were similar to those observed in acute yellow atrophy and late chloroform poisoning. These symptoms were carefully compared, and Dr. Phillips concluded that the disease in his cases was due to an ascending toxæmia of the bile-ducts.—The PRESIDENT thought it noteworthy that only five cases of hepatic toxæmia had occurred in a total of 2000 deliveries. He judged from this fact that a special combination of morbid conditions was needed to bring about the storm. Again, the rapid fatality in two of the cases and the milder attack in those which recovered suggested the same idea of varying intensity of combination. In formulating any theory three factors would have to be considered: (1) The changes in the liver cells associated with fatty metamorphosis; (2) the action of toxic substances ascending by way of the bile ducts from the intestine; and (3) the influence of chloroform as a determining cause. He agreed with Dr. Phillips that the mischief was started by intestinal disease and spread along the line of the hepatic vessels and ducts. Fatty metamorphosis and chloroform inhalation were possibly additional factors in determining the onset and severity of the symptoms.—Dr. ROUTH thought the title of Dr. Phillips's paper might be altered to "Toxæmia in Pregnancy Affecting the Liver," for he thought true pregnancy toxæmia began in the cells of the chorionic villi and affected different secreting or glandular organs, according to the type of toxin or the condition of the patient's organs. Most of Dr. Phillips's cases were associated with bacillus coli cystitis, and in such cases the liver troubles might be due to ascending intestinal infection by the same organism or by toxins derived from those bacilli.—Dr. HERBERT WILLIAMSON said that thanks were due to Dr. Phillips for focussing attention upon a group of cases which were occasionally met with in practice and which gave rise to a considerable degree of anxiety. He was not, however, able to accept the suggestion that the group of cases reported in the paper constituted a clinical entity. He agreed that they were cases of toxæmia and that the toxins had evidently produced severe hepatic lesions. Clinical and pathological observation suggested that during pregnancy the liver appeared to be peculiarly susceptible to the action of toxins, and it was clearly established that the incidence of acute yellow atrophy was much greater in the pregnant than in the non-gravid state. Dr. Phillips's cases supported the view he (Dr. Williamson) took that, given the susceptibility, the actual lesions might be produced by a variety of toxic agents, such as poisons produced by the epiblastic tissues of the chorionic villi, poisons produced by the bacillus coli communis, or chemical poisons such as chloroform. He thought that all these three groups were represented in the collection of cases reported by Dr. Phillips.—Dr. WALTER GRIFFITH and Dr. EARDLEY HOLLAND also discussed the paper.

Reviews and Notices of Books.

Serums, Vaccines, and Toxins in Treatment and Diagnosis.

By WILLIAM CECIL BOSANQUET, M.A., M.D. Oxon., F.R.C.P. LOND., Physician to the Charing Cross Hospital; and JOHN W. H. EYRE, M.D., M.S. Dunelm., F.R.S. Edin., Director of the Bacteriological Department of Guy's Hospital. Third edition. Illustrated. London: Cassell and Co. 1916. Pp. 456. Price 9*s.* net.

IT is more than six years since we noticed the second edition of this valuable little volume on a very big subject. The intervening period has been so fruitful in research and has witnessed such notable advances in methods of diagnosis and treatment that the authors have found an exhaustive revision necessary, entailing the addition of nearly 100 pages of new matter. A perusal of the book will assure the reader that additions are to be found on nearly every page containing abstracts of recent publications as well as, in most cases, the conclusions drawn by the authors from their own observations. Experience drawn from the present war is still too tentative for sweeping conclusions except in certain particulars. Of the prophylactic use of tetanus antitoxin the confident statement, "There is ample evidence that antitoxin proves of greatest service in the prevention of tetanus," takes the place of the hope expressed in the previous edition. And of antityphoid inoculation the authors state in their new edition that the experience gained during the present war forms a striking testimony to the value of antityphoid vaccination as practised in the British army, instead of the faint recommendation of inoculation to persons going into parts of the world where enteric fever is very prevalent. On the other hand, the recent work on the serum or vaccine treatment of tetanus, typhoid and cerebro-spinal fever is given with due reserve as to the worth of these methods. With the inclusion of most work of real value we miss the report by Surgeon-General H. D. Rolleston on the serum treatment of cerebro-spinal fever in the navy. A new chapter, headed "Diseases due to Protozoa," has been introduced, containing a useful summary of the principles of chemotherapy, and although admittedly trespassing somewhat outside the domain indicated by the title we agree with the authors that they were justified in its inclusion. Mention of the sulphur and antimony substitutes for organic arsenic compounds brings the subject matter up to quite recent date.

We assume that this new edition of Dr. Bosanquet and Dr. Eyre's book will be widely used by many who cannot readily refer to original sources. It is therefore the more regrettable that a serious error in the second edition has been allowed in part to creep over into the third. In the second paragraph on the mode of using tuberculin for diagnostic purposes, commencing on p. 304, it is correctly stated that Koch recommended an initial dose of 0·001 c.c. or of 0·0001 c.c. in delicate individuals, and a second dose of double the quantity if no reaction takes place. It is then stated: "If, however, no effect is produced by the small doses they may be increased to 0·5 and even to 1·0 c.c.; and this final dose may be administered twice in order to make sure of the absence of a reaction." Koch is here credited with having recommended an increase of 500 times or 1000 times the initial dose. Of course, he did nothing of the sort. He recommended an increase of five or ten times only, and the error has occurred in the text from rendering 5 mg. and 10 mg., which are the actual quantities Koch gives, as 0·5 and 1·0 c.c. instead of 0·005 and 0·01 c.c. Koch himself laid stress on the fact that 10 mg. or 0·01 c.c. of Old Tuberculin was the largest amount that could be given without risking a reaction in the non-tuberculous subject, and he records having administered 250 mg. or 0·25 c.c. to himself and been rewarded with a severe and painful reaction. The same error is present in all the figures given in the third paragraph. Junker advised a series of 1/10, 5/10, 1, 5, and 10 mg. or 0·0001, 0·0005, 0·001, 0·005, and 0·01 c.c., and not the hundredfold doses stated in the text. Löwenstein and Kauffmann's valuable suggestion to give a series of four equal doses of 0·0002 c.c. is rendered as four doses of 0·02 c.c.; Röpke is similarly misrepresented, and so it goes on. Only Trudeau's dosage has been correctly revised, and the authors' conclusion that one-thousandth of a cubic centimetre is probably the largest dose which should ever be administered for diagnosis, and their recommendation of the series 0·0001, 0·0002, 0·0005, and 0·001 c.c. as the most suitable are not widely different from those of the authorities whom they misrepresent. An early opportunity will doubtless be taken of correcting errors which, if followed, might have dangerous results.

Apart from this blemish and from a tendency to retain for completeness sake preparations no longer used for which oblivion would have been appropriate, we should like to emphasise our high opinion of this manual. The language throughout the book is clear, the explanations simple and lucid; original references are supplied to all important work, and the reader is given a sound basis for his knowledge and opportunity of readily pursuing it further.

Monographs on Biochemistry: The Respiratory Exchange of Animals and Man.

By AUGUST KROGH, Ph.D., Reader in Zoophysiology, University of Copenhagen. With diagrams. London: Longmans, Green, and Co. 1916. Pp. 173. Price 6*s.* net.

THE editors of this series continue their praiseworthy task of supplying monographs on specific physiological problems by authors who themselves have been active workers on the several subjects. In the latest monograph, which is before us, Dr. Krogh, of Copenhagen, points out that the subject of the respiratory exchange of animals belongs rather to the domain of chemical physiology than to that of physiological chemistry. The book deals with very few substances, and with their quantities, not their qualities and the reader will find it to be an excellent résumé and exposition of a difficult subject, including descriptions of technique which differ somewhat from that employed in other branches of biochemical work.

The following are some of the problems dealt with. The physiological significance of the exchange of oxygen and carbonic acid, including the carbon balance, respiratory quotient, and direct and indirect calorimetry; methods for measuring the respiratory exchanges; the exchange of nitrogen, hydrogen, methane, ammonia, and other gases of minor importance; standard metabolism and the influence of internal factors on it, and the variations in standard metabolism during the life cycle of the individual; the influence of chemical and physical factors upon the respiratory mechanism; and, lastly, the respiratory exchange in different animals. The author points out that in studying the respiratory exchange of an animal we have to do with a quantity which is variable in the extreme. In man the maximum respiratory activity is 10 to 20 times the minimum in one and the same individual, and in many lower animals the maximum may be several hundred times the minimum. The factor which is of paramount importance in determining the metabolism is the functional activity. This shows one of the difficulties of obtaining the standard metabolism of an organism. To pharmacologists the chapter on the influence of various drugs will prove attractive. The old view of Pflüger (1873) that the animal cell itself determines its own respiratory exchange has recently been contested by Thunberg (1905), who maintains that the oxidative processes must increase with increased oxygen pressure and gradually approach a maximum. Another view, that of Moleschott (1855), that the respiratory exchange of animals is higher in light than in darkness, must, it appears, be given up—the most recent experiments show that no measurable effect of light could be detected; but even this does not satisfy the author, who suggests that experiments be made on hyaline aquatic animals suitably narcotised to ensure standard conditions. The chapter on hibernation in mammals is interesting. Not a single bird manifests this phenomenon.

A valuable bibliography of nearly 16 pages gives some idea of the "intensive" study devoted to this limited yet fundamental problem in chemical physiology. Every physiologist must feel that Dr. Krogh has rendered a notable service by presenting in a readable and easily assimilable form the results of his research.

LIBRARY TABLE.

A Contribution to a Knowledge of Canadian Ticks. By GORDON HEWITT, D.Sc. Scientific Contributions from the Entomological Branch, Department of Agriculture, Ottawa. Reprinted from the Transactions of the Royal Society of

Canada. 1915. Pp. 16. *How to Deal with the Fly Nuisance.* Broadsheet issued by Department of Agriculture, Canada. *The Suppression of Two Insects Affecting Troops.* By GORDON HEWITT. Leaflet issued by Department of Agriculture, Canada. 1916.—In the first of these three publications there is to be found a critical list of the ticks known to occur in Canada with their hosts, and the published literature dealing therewith. No new species are described, but five of the species referred to are illustrated in three plates. The memoir concludes with a bibliography supplementary to that quoted in the text under the heading of the various species. The two remaining publications are purely official and in no sense technical. They are for the practical use of the public. The two insects referred to in the leaflet are the domestic fly and the louse, and both are figured.

Sight-Testing Made Easy. By W. WRIGHT HARDWICKE, M.D. St And., M.R.C.P., L.R.C.S. Edin. London: J. and A. Churchill. 1916. Pp. 80. Price 2*s.* 6*d.* net.—The intention of this unpretentious little manual is to enable the busy practitioner to test the sight of a patient and to prescribe correcting glasses for him. The fact that it has reached its third edition is evidence that it has supplied a real need, but it does not excuse certain errors still to be found. For instance, when dealing with presbyopia on p. 65, the author quite properly insists that the patient should be tested first for distant vision; but on p. 66 he tell us that the correction is "the weakest spherical lens which enables the patient to read at a comfortable distance." If this be the correct procedure, why test for distance first? On p. 65, again, we are told that at the age of 75 the glasses generally required are of the strength of 5·5 D. Now a patient of 75 has practically lost all power of accommodation, consequently in order to see at 1/3 or 1/4 metre he must have + 3 D. or + 4 D. added to his correction for distance. If + 5.5 D. were added the unfortunate old man would only be able to see at a distance of 1/5·5 metres (7·16 inches), and he would almost certainly suffer from asthenopia induced by the extreme convergence involved. On p. 13 the table called "Range of Accommodation" should be denoted "Amplitude of Accommodation," and, further, it should be corrected in accordance with the more accurate values that Dr. Duane gave us some six years ago.

Hints on Refraction. By SUBODH KUMAR GANGULY, M.B. Calcutta: Neogi Nababibhakar Press. 1916. Pp. 36. Price 12 annas.—This pamphlet reminds us of the well-thumbed pocket manuals used by many of us in student days; they had their uses, and this is an excellent example of this type of *vade-mecum*. Sometimes there is an omission of an important word that makes the meaning ambiguous. For instance, on p. 1: "Recognition: A spherical glass through which objects appear to move (the examiner's eye being emmetropic or rendered so) (*a*) in opposite direction and look larger = convex; (*b*) in same direction and look smaller = concave." Of course, the objects only appear to move when the lens is moved in front of the eye. There is a similar omission in the paragraph headed "How to Find Out the Strength." On p. 10, 6 (*b*) there is a misprint of "under-corrected" for "over-corrected," but we have failed to find any other errors. Under contra-indications to cycloplegics, in addition to the usual warnings about glaucoma, is added a new one, "In Times of Epidemic Dropsy and Beri-beri." There is a vast amount of accurate information concisely and clearly expressed in this little book.

Tuberculosis and the Working Man: An Appeal to Friendly Societies. By P. C. VARRIER-JONES, M.A. Cantab., M.R.C.S., with a preface by G. SIMS WOODHEAD, M.D Edin., LL.D. Cambridge: W. Heffer and Sons. 1916. Pp. 47. Price 6*d.* net.—Mr. Varrier-Jones's lecture, to which Professor Sims Woodhead has contributed an approving preface, is a strong plea to the Friendly Societies to assist in the after-treatment of the consumptive working man. The inelastic rule of no longer paying club money when any kind of work can be done presses on such a man with peculiar hardness. He is either condemned to a life of idleness; in Mr. Varrier-Jones's words, "he walks up and down the village and meets his acquaintances, who daily inform him that he looks fit for work. He is usually melancholy, has no interest in life, and is convinced that he cannot recover." Or, on the other hand, if he undertakes light work and in so doing forfeits his club money, he finds the pay insufficient to provide adequate food for himself and his family, and the combined anxiety and malnutrition inevitably lead up to a second breakdown. Mr. Varrier-Jones advocates that when a man returns from a sanatorium he should be encouraged to resume his former work for short hours, and that so long as he is thus working short time his food allowance should be brought up to the necessary standard by club funds. The lecture puts attractively the case for assistance, and is worthy of the serious attention of the Friendly Societies, to whom it is addressed.

CURRENT GERMAN MEDICINE.

The Austro-German Medical Congress at Warsaw, May 1st and 2nd. (Summarised from a report in the *Deutsche Medizinische Wochenschrift*, Nos. 21–23.).—After a few words of welcome by H.E. General v. Beseler, Governor of Warsaw, the head of the German Army Medical Service, Professor von Schjerning, gave an interesting survey of its organisation. There were, he said, more than 24,000 doctors in the service of the army, of whom 16,000 were actively employed at the front. Besides these, the Army Medical Service included 3000 doctors employed in Red Cross work, 400 surgeon-dentists, 1800 pharmacists, and 92,000 men in the sanitary and ambulance departments. These were assisted by 72,000 voluntary nurses, male and female, at the base hospitals, and 22,000 in the war zone. Thousands of motor-cars and vans were engaged in transporting the sick and wounded to the war hospitals, of which there were 238 in the whole country. There were also thousands of installations for the sterilisation of water, for disinfection, and X ray examinations; 26 large mobile steam laundries were kept busy day and night for the military hospitals alone; and there were 18 large disinfecting stations through which 100,000 men could be passed daily and their clothes dealt with. The central medical depôt forwarded to the front daily wagon-loads of medical preparations and surgical appliances. Surgeon-General His, the President of the Congress, spoke of the successes hitherto attained in combating epidemics, asserting that "in spite of typhus and dysentery, spotted fever and cholera the efficiency of the troops has never been impaired." Several scientific investigators had lost their lives during the war in combating these and other invisible enemies, amongst them Cornet, Prowazek, Lüthje, Jochmann, Römer, and Tilp. New diseases had been discovered, to one of which the name of "five-day fever" had been given. Well-known diseases, such as typhoid and dysentery, appeared in modified form owing to previous inoculation.

Cholera.—The struggle with cholera was described by Colonel S. A. Hoffmann. He stated that Galicia had suffered terribly from the disease which had also made its appearance among the German troops on the Polish frontier. The sickness-rate, however, even among troops who had in the height of summer traversed the cholera-stricken Galicia and the Rokitno marshes, did not exceed 0·5 per cent., or a quarter of the rate prevalent in the Greek army. Owing to the success of the inoculation carried on among the armies in October, 1914, only 10·2 per cent. of those attacked died, whereas the case mortality among the uninoculated troops reached the high figure of 50 per cent.

Cardiac affections in combatants.—Dr. Wenckebach (Vienna), who opened the discussion on soldiers and heart disease, had noted numerous cases of pure left ventricle hypertrophy from prolonged exertion. While endocarditis was infrequent in the field, arterio-sclerosis and its results were common, especially among the older men. Soldiers with fully compensated valvular lesions often came unscathed through exhausting actions. He thought that organic heart disease had been diagnosed far too frequently on account of subjective symptoms, many of which were due to the man's previously sedentary life. Various speakers alluded to the difficulty in diagnosis, increased by the methods of examination in vogue at the different universities. Dr. R. Kaufmann (Vienna) on a large material had been led to conclude that over-exertion was a less potent factor than a preceding infection, in many cases enteric fever or dysentery. In the discussion which followed, nervous tachycardia and hyperthyroidism were both deemed factors of importance. Prognosis was good in four-fifths of the cases, but recovery slow. Treatment should include graduated marches and gymnastic exercises, with appropriate psychic therapy.

Typhus.—Dr. Brauer (Hamburg) opened with a comprehensive account of typhus as a fever of sharply defined

characteristics, always involving the blood-vessels, as seen in the nodular peri-arteritis producing the eruption and an endarteritis frequently resulting in gangrene of the toes. He regarded the infection as conveyed exclusively by body lice. Dr. Jürgens (Berlin) considered the conclusion justified that the infecting organism develops at certain times forms which require the louse for their further evolution, at a certain stage of which the organism becomes again infective for man. An infected louse infects also its eggs. He regarded the virulence of the epidemic as determined by the condition of the recipient rather than by variations in the infecting agent. Fatigue and hunger among the Serbs, simultaneous diphtheria in an epidemic nearer home, had combined to produce an alarming mortality. Dr. Hase spoke on the biology of the louse, dwelling on its extraordinary resisting power to chemical and physical agents. It lived exclusively on warm circulating blood and occupied hours over a meal, during which time it was quite insensitive to the removal of antennæ and limbs. On a Russian 3800 lice had been counted. Dr. Rocha (Lima) described the presence of bodies resembling bacteria in infected lice from the skin of patients 4–8 days ill, named by him provisionally Rickettia Provazekii. Dr. Toeffer (Berlin) claimed to have discovered these bodies independently. Urotropin in large doses and the serum of convalescent patients were recommended in treatment.

Typhoid and Paratyphoid.—Dr. v. Krehl (Heidelberg), in introducing the subject of typhoid, alluded to the marked splenic enlargement observed during the present war, even in slight cases after inoculation, and as a result of inoculation itself, and this enlargement frequently persisted after recovery. In severe cases typhoid bacilli were found in the blood from the onset and far into the course of the disease. Heart muscle affections had been very frequent during convalescence, and relapse commoner than in peace. The treatment with vaccine was on its trial and not encouraging as yet. Surgeon-General Hünermann spoke of the great success with the preventive vaccine of Pfeiffer-Kolle, heated only to 53°–55° C. Among many million injections harmful results had been quite occasional and no single fatality had occurred. Contrary to general belief, he held that an injection while the disease itself was incubating did not influence the course unfavourably; on the contrary, a milder course was the rule. The mortality of 9·6 per cent. in the uninoculated fell to 6·6 per cent. in those with two injections and to 2·6 per cent. in the reinoculated. In the latter the course of the disease was as a rule exceedingly mild. Typhoid carriers were uncommoner among the inoculated. He estimated the protection as lasting about six months. For the Austrian armies Dr. Kaup gave the percentage of severe cases in the uninoculated as 44, with one injection 29, and with two 11. The case mortality similarly fell from 13–16 per cent. to 5–6 per cent. After from seven to eight months the immunity developed by inoculation had practically disappeared. The routine reinoculation took place after seven months. In the discussion Dr. Krause (Bonn) put the percentage of carriers after attack of typhoid at 4·1, in whom in most cases gall-bladder or intestinal catarrh (bacilli in stools) or pyelitis (bacilluria) could be demonstrated. Dr. Stintzing (Jena) described the course of paratyphoid; he held that many cases were called typhoid, dysentery, intestinal catarrh, or influenza. Carriers of paratyphoid B were to be found among the troops, but cases remained as a rule isolated. Bacilli appeared in the blood sooner than with typhoid. It took, as a rule, at least three months for a case to become free of infection. The case mortality was 1–2 per cent., a little higher in paratyphoid A. He advocated immunising with a mixed vaccine of typhoid and paratyphoid A and B.

Dysentery.—After describing the course of dysentery and its characteristics in the present campaign, Dr. Matthes (Marburg) spoke with approval of the use of serum treatment in the field, the dose being 100 c.c. or more, adding that equally good results had been obtained with normal horse serum. Of all remedies intestinal lavage had proved the most efficacious. Dr. Kruse (Leipzig) spoke of the prevalence of pseudo-dysentery and of the uselessness of preventive inoculation.

Nephritis in the Field.—Dr. Hirsch (Göttingen), who introduced the discussion on nephritis, said that in contrast with the campaign of 1870–71 nephritis had been relatively common. The men between 35 and 40 were specially susceptible, and the proportion affected was much greater in the eastern than the western field, in the infantry than the cavalry and engineers. Damp undoubtedly played a chief rôle, and the frequency was greatest from October to December and in March and April; some cases were preceded by various infections, such as sore-throat, boils, enteric fever, or dysentery. In many cases œdema and serous effusion rapidly occurred; the urine was diminished, in 50 per cent. of cases blood appeared in it and much albumin, 6 to 8 per mil. or more. Retinitis was not seen. The picture was of a glomerulus affection combined with some tubular degeneration. The prognosis was good, the case mortality not reaching 1 per cent. In the discussion Dr. Goldscheider (Berlin) and Dr. Jungmann (Berlin) among others emphasised the infectious origin, the former stating that in 25 per cent. of cases no exposure had occurred. Dr. Th. Rumpel (Hamburg) gave an account of a forced march in full kit, after which 24 per cent. of the men had more than a trace of albumin, 80 per cent. hyaline and granular casts, 25 per cent. red blood cells (35 per cent. even gave a benzidin reaction), and 20 per cent. had acetone and aceto-acetic acid in the urine. Dr. Citron (Berlin) had generally noticed an antecedent (5–14 days previously) febrile affection, and in 90 per cent. of cases this was a streptococcal tonsillitis; he practised tonsillectomy with good result. Points mentioned by others were the almost complete immunity of officers; a desquamation of forehead and head noticed in two-thirds of the cases at the end of the third week; the occurrence of splenic enlargement (in 6 per cent.) and of eosinophilia (in 10 per cent.). Dr. Rostoski (Dresden) was frequently able to isolate typhoid bacilli from the urine and Dr. Porges (Vienna) a streptococcus.

Reports and Analytical Records
FROM
THE LANCET LABORATORY.

OXYDOL OINTMENT.

(NEW OXYDOL PRODUCTS, LIMITED, 23, FITZROY-SQUARE, LONDON, W.)

THE successful incorporation of active peroxide of hydrogen with a fat deserves attention, for the resulting ointment means that a powerful antiseptic and a substance promoting healing may be introduced in this way. We have examined two specimens of oxydol ointment, one of which occurs in the form of cream and the other as a stick. Both are of a clean white opaque appearance, and both give a large quantity of oxygen when suitably treated. This oxygen is available for the treatment of wounds, cuts, burns, and so forth. The ointment has already given very good results with eczematous patches, and it has a rapid healing effect on chapped lips or hands. It is reasonable to think that the unguent penetrating the pores of the skin takes with it the oxydol or peroxide of hydrogen. We do not remember to have met with an ointment before which carries and keeps intact active peroxide of hydrogen. The innovation suggests many applications in which it is conceivable that nascent oxygen would be of service. It is stated to be very useful in the treatment of chilblains and in frost-bite, while in one report we have received it appeared to give good results in cases of impetigo. The ointment is perfectly uniform and is stable.

ASPIRIN.

(PICKARD, IVE, AND RANKIN, LIMITED, WALMER CHEMICAL WORKS, WALMER-ROAD, NOTTING HILL, LONDON, W.)

The makers state that this specimen is an entirely British product and we have no reason for doubting that it is identical with acetyl-salicylic acid. It is a clean, white crystalline powder which, as we have found, fulfils the requirements of the British Pharmacopœia. It yielded practically no mineral matter on incineration, and gave no evidence of the presence of free salicylic acid, which is, perhaps, the most important test.

SOLAC.

(SOLAC LIMITED, 221, TOTTENHAM COURT-ROAD, LONDON, W.)

Solac, which has been described as synthetic milk, was fully examined and reported on by us in our issue of Dec. 4th, 1915. The product then showed a composition similar to that of ordinary milk, but it has since occurred to the makers to increase the proportion of fat, and we

think the idea is a good one. According to our analysis we find that this special solac contains 7·24 per cent. of fat present in the same highly emulsified and suspended state as is the case with natural milk. The total solids amounted to 15·98 per cent. These results represent, in fact, the composition of cow's milk with the amount of fat doubled. It seems to us to be a valuable fatty food, which on account of its easy assimilability should be of service in cases where rapid nourishment is required and particularly in wasting diseases. It, moreover, possesses a high energy value. Its taste strongly resembles ordinary milk, as does its appearance; it is soft and creamy.

TINTARA WINE.

(BURGOYNE AND CO., 5, DOWGATE-HILL, CANNON-STREET, LONDON, E.C.)

This is a typical Australian red wine, full-bodied and of rich colour. It approaches in character, comparing it with European wines, the burgundy of France, and its analysis gives similar results. The grapes produced in Australia are of a luscious character, and accordingly the product is, as a rule, of a generous description. In our opinion these wines in regard to flavour are often more appreciated when slightly diluted with water. The taste then is mellow and quite non-acid, and resembles that of the similar French wines closely. Adding water, of course, means thinning the full-bodied wine down to one of a more delicate kind. Thin, delicate wines do not, as a rule, bear dilution well. The robustness of this wine is evidenced in the following analysis which we have made: Alcohol by weight, 12·38 per cent., equal to 26·82° proof spirit, and therefore imported under the low rate of duty; extractive matters, 3·47 per cent.; mineral matters, 0·37 per cent.; volatile acidity reckoned as acetic acid, 0·05 per cent.; fixed acidity reckoned as tartaric acid, 0·45 per cent.; sugar, 0·54 per cent. The mineral matters contained distinct quantities of both phosphates and iron. The wine is the genuine fermented product of the grape, and is thoroughly wholesome.

New Inventions.

DIFFERENTIAL STETHOSCOPES.

INTEREST in the relative intensities of the heart sounds has revived recently. This has led to many inquiries as to the relative merits of the differential stethoscopes designed by Oertel and by Bock.

The Oertel stethoscope consists of a chest piece to which a metal tube is attached; in this tube there is a slit which can be opened, and the width of the opening can be read on a scale. A second tube slides over the one with a slit, and can make the slit of any length up to 4 cm. To the end of this tube a Y tube is fitted which is attached to the tubes of a binaural stethoscope. The arrangement provides a stethoscope with a window the area of which can be varied at pleasure and measured accurately. The method of using it is to make the width of the slit 1 mm., and then slide the outer tube towards the graduated end until the slit is covered completely. The chest piece is then applied over the apex of the heart and the slit uncovered until the first sound cannot be heard. On shortening the slit the sound is heard again; the length of the slit when the first sound is just lost is noted. The slit is once more covered by the sliding tube, and then the chest piece is transfered to the aortic site and the slit uncovered again until the second sound is just lost. The length of the slit is noted again. In normal cases the size of the window necessary for the first sound at the apex to be lost is twice that required to prevent the second sound at the base reaching the ears. If the heart is beating vigorously, and making very loud sounds, the slit must be opened to 2 or more millimeters. However loud the heart sounds, their intensities can be measured by this instrument because not only does sound escape through the window, but also external sound is admitted which overpowers the sound of the heart. This makes it obvious that for successful results the instrument must be used in a quiet room or in one with a constant noise.

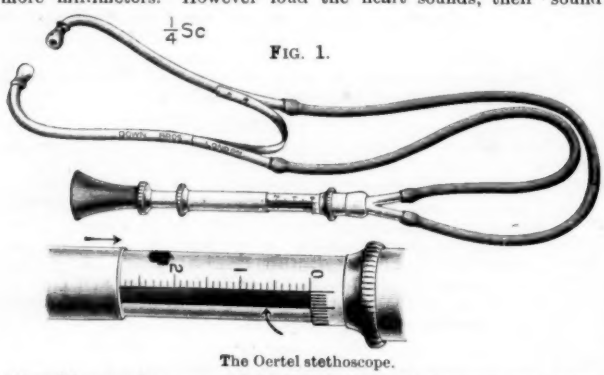

FIG. 1.

The Oertel stethoscope.

The Bock differential stethoscope depends upon a different principle. It consists of a conical chest piece attached to a circular box which is divided into two compartments by a thick metal diaphragm which is pierced by a small hole. Into this hole a cone of metal can be inserted until the aperture is completely closed. When the hole is closed, air-borne sounds are stopped. In a well-made instrument with the diaphragm set correctly the screw moving the cone turns quite easily until the hole is completely closed: if adjusted badly the screw becomes stiff some distance before it comes to a stop. The pointer should be set at 100 when the hole is closed. The method of using the instrument is by opening the aperture by one complete revolution of the screw, placing the chest piece over the apex of the heart, and turning the screw until the first sound is no longer heard. The position is noted; the average position is 80. The pointer is turned back again to about 10, the stethoscope is applied to the aortic site, and then the pointer turned until the second sound is lost. This occurs on the average at about 60. That is to say, the intensity of the first sound at the apex is audible when the hole in the diaphragm is half the size of that necessary for the conduction of the sound produced by the second sound over the aortic site. Emphysema and a thick chest wall diminish the amount of sound conducted, but do not alter the ratio. Sometimes the heart beat is so vigorous that it can be heard when the hole is closed and the pointer is at 100. This is due to conduction through the solid part of the stethoscope. To overcome this, which is a rare event, a felt ring may be interposed between the stethoscope and the chest wall or some poor conductor of sound introduced between the instrument and the rubber tubes. In order that observations of any value shall be obtained, the sound must be air borne and not transmitted through solids.

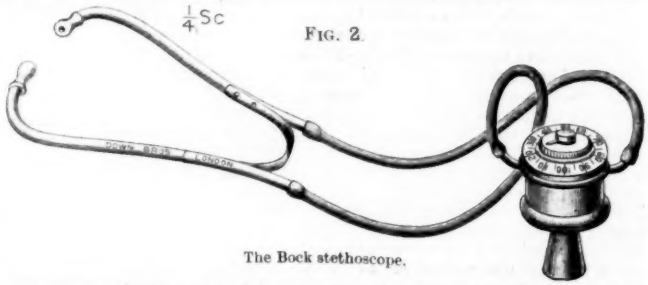

FIG. 2.

The Bock stethoscope.

In my experience, the Bock stethoscope has proved the more useful because it can be used in comparatively noisy surroundings, and there is but a small percentage of hearts in which the sounds are conducted when the diaphragm is closed. The Oertel stethoscope can compare intensities however vigorous the heart, but for accurate work it requires an absolutely quiet room. Messrs. Allen and Hanburys, of Wigmore-street, London, W., have made satisfactory Bock stethoscopes, and Messrs. Down Bros., of St. Thomas's-street, S.E., are making both.

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Physician to the London Hospital.

THE LANCET.

LONDON: SATURDAY, JULY 1, 1916.

Military Medical Home Service.

THE demand for medical officers in the army still continues acute, though the number of certificates of enrolment issued by the Central Medical War Committee is now considerably over 4000, while commissions have been posted at an average of over 40 a week for nearly a year. When, leaving our huge navy out of count, the size of our armies at home and abroad is considered, and when we remember the enormous scope of the operations entailed upon the Allies by their widely separated fronts, there should be no surprise either that the medical profession should be numerically strained by the circumstances, or that at any moment an excess of medical officers may exist at one place coincident with a demand at another place. The categorical statements of the Director-General of the Army Medical Service, as well as the detailed information which has gradually reached the country from the various seats of war, have, we think, dispelled the idea that our army has been hitherto rather enjoying a plethora than resenting a shortage of medical officers. We are glad to notice that statements to this effect have ceased to be made in responsible quarters, and this should have an effect upon chatterers in Parliament.

To meet the acute calls for medical officers with the army vigorous steps have been taken in many directions by the Central Medical War Committee and the other committees recognised by the State as responsible for the supply of medical officers to the Navy and Army. The personnel of the medical profession in England and Scotland has been scrutinised, local and educational authorities have dispensed with the services of many of their officials, and all over the country there are districts which have been gravely depleted of medical men. And as the urgent demand yet remained unsatisfied, some believed that a breaking point had been reached, when a wise decision not to limit the offer of commissions in the Royal Army Medical Corps to medical practitioners under 45 years of age was arrived at. Many Territorial medical officers and members of *à la suite* staffs at hospitals were, of course, serving in the Royal Army Medical Corps at a more advanced age, but the offer of commissions to other practitioners did not until a few days ago extend to those who were more than 45 years of age. Now, under altered circumstances, an appeal is made for men to accept commissions in the Royal Army Medical Corps, being between the ages of 45 and 55. The military medical service of these middle-aged officers will be at home, and they will be employed especially to free the younger medical men, of whom every one who can possibly be spared should be serving with the armies in the field. The older medical officers will be employed with troops which are not intended to go abroad, and we are certain that they can meet all the requirements of any army prepared and retained in these islands against the risks of invasion. The hospitals staffed by the men of over 45 would be in perfectly safe hands, especially as here the part-time man can be employed, as he can be in the garrisons of the ports and military stations.

It is impossible to estimate how large a number of medical practitioners there may be in the country between the ages of 45 and 55 who are available to take whole-time commissions with the Royal Army Medical Corps, but the information possessed by the Central Medical War Committee is now of very precise and detailed character, so that in any given locality the needs of the community can be carefully watched—far more carefully, indeed, than at one time seemed possible. In these circumstances the supply of middle-aged men to take whole-time commissions in the Royal Army Medical Corps who are prepared to serve with military units anywhere in the British Isles, and who can be spared from the civilian community in which they practise, ought, we think, to be forthcoming. In our belief there are a good many medical men who fall within this category and who will be very pleased to avail themselves of the opportunity thus given of serving their country, and when they present themselves in substantial numbers there will, it seems to us, be very little excuse for the retention of the younger officers in this country. They will also leave the garrison duty for part-time men, an important point, as it is one of the many criticisms to which the Army Medical Service has been subjected that not sufficient use has been made of the part-time man. As a matter of fact, the local nature of the help that he can offer is a bar to his employment save in certain capacities.

Alimentary Rest in Diabetes.

THE treatment of diabetes by fasting is not a new one. GUELPA strongly advocated it on the ground that the disease was due to alimentary toxæmia. His method yielded good results, although the theory on which it is based is not necessarily correct, and indeed is not generally accepted. He recommended cautious return to the usual diet after the fast, although he did not lay down a definite plan for doing so. VON NOORDEN interpolated days of fasting and also days of vegetable and egg diet; but here, again, there was no definite plan of building up the diet after such days. ALLEN, in America, made a decided advance in our treatment of diabetes by making the fast the first step and following it up by a scheme regulated by urinary analysis. Briefly, the method is that the patient should fast till free from sugar. He is allowed to drink water freely, and can take tea, coffee, and clear meat broth as desired. When the 24-hour specimen of urine is

free from sugar 150 grammes of vegetables containing not more than 5 per cent. of carbohydrates are added, and then 5 grammes more are added every day until 170 grammes are reached; the intake is then increased by 5 grammes every other day, foods richer in carbohydrate being gradually added, until bread is reached, unless sugar appears or the tolerance reaches 3 grammes of carbohydrate per kilogramme of body weight. When the urine has been free from sugar for two days three eggs are added, equivalent to 20 grammes of protein, and thereafter 15 grammes daily in the form of meat until the patient is receiving 1 gramme of protein per kilogramme of body weight, or, if the carbohydrate tolerance is nil, only ½ gramme per kilogramme. Fat, other than that contained in the eggs and meat, is only added when this point is reached, and then 25 grammes of fat are added daily until the patient ceases to lose weight or receives not more than 40 calories daily per kilogramme of his weight. If sugar returns, fasting is resumed for 24 hours or until the urine is free from sugar. The diet is then increased twice as quickly as before, but the carbohydrate is not allowed to exceed half the former tolerance until the urine has been free from sugar for two weeks, and it should not then be increased more than 5 grammes per week. He also advised that when the tolerance for carbohydrate is less than 20 grammes of carbohydrate fasting should be practised one day in each week. When the tolerance is between 20 and 50 grammes vegetables containing 5 per cent. of carbohydrates and one-half the usual quantity of protein and fat are allowed on one day in the week instead of the fast. If the tolerance is more than 100 grammes of carbohydrate, the intake of carbohydrate is merely halved one day each week.

As often happens, different observers have been reaching a somewhat similar conclusion independently by another route. GARROD and GRAHAM have mapped out a plan, largely by observations on the sugar content of the blood. Their method is less drastic, and therefore easier for the patient. They do not make him fast for more than 48 hours, even if the urine still contains some sugar. Then two days of VON NOORDEN'S vegetable and egg diet follow. After this the protein intake is gradually increased. Thus 2–3 oz. of ham and 3 oz. of fish are added after the vegetable and egg days. Next day 3 oz. of meat are substituted for the fish. Another fast is advised at the end of three to four weeks if sugar is still present. In both methods the diet is cautiously pushed up, but while ALLEN'S plan involves a longer fast, that of GARROD and GRAHAM demands more prolonged abstention from starchy foods. LANGDON BROWN has combined the two procedures by testing the tolerance of the patient to potatoes soon after the meat stage is reached if the patient is then free from sugar. The tolerance of a number of carbohydrate foods is tested in succession, such as Jerusalem artichokes, green peas, apples, and milk. In this way a varied diet can be arrived at fairly quickly, and as individual tolerance to various carbohydrates differs, the offending item in the diet can speedily be detected. Attention has been focussed on these fasting procedures by the recent discussion opened by Dr. O. LEYTON at the Therapeutical Section of the Royal Society of Medicine, when Dr. E. I. SPRIGGS reported on the experience gained at Duff House. It was generally agreed by the participants in that debate that the milder cases in later life usually respond rapidly to some such method of fasting. As to the more severe cases, it may be possible to free the urine from sugar for a time, but sometimes at too high a cost for the general well-being of the patient. Even in the severer cases, however, a modified fasting plan, not on such drastic lines as ALLEN'S, will probably help more than any treatment hitherto followed.

The influence of fasting on acidosis in diabetes is interesting and rather unexpected. Whereas fasting causes some acidosis in a healthy individual, it diminishes acidosis in diabetes. But then the acidosis in diabetes reaches a much higher figure than is ever met with in healthy persons. What appears to happen is that the slight acidosis of starvation continues in the fasting diabetic, but the dangerous toxic acidosis is greatly lessened. This points to the high degree of acidosis in diabetes being caused by the lavish use of proteins, and possibly fats, in the old-fashioned strict diabetic diet. Instead of saying that because a patient cannot assimilate carbohydrate *therefore* he must take more protein and fat, we must conclude that because his tolerance for carbohydrate is low it is not safe for him to indulge in an unlimited amount of other foods in the absence of carbohydrates. In other words, a diet carefully balanced at a lower level is better than a lopsided diet. On such a plan as this coma is much less likely to occur than on the old method, and alkalies will not be found so necessary. While it is by no means true that fasting procedures are a panacea in diabetes, it is true that a short fast followed by careful graduation of the diet to the assimilative power of the individual is a decided advance on any treatment hitherto introduced. This can be said without hesitation, although the method has not been employed long enough yet for us to gauge its ultimate effect.

ROYAL MICROSCOPICAL SOCIETY.—At a meeting of the Royal Microscopical Society held on June 21st Miss G. Lister, F.L.S., made a communication on the Life-history of Mycetozoa, with Special Reference to Ceratiomyxa, in which she referred to the work of Dr. Jahn, of the Berlin University, proving that the amœbulæ produced by division of the swarm-spores united in pairs as gametes to produce zygotes, from which the plasmodia grew. The nuclei of the zygotes had twice as many chromosomes as the nuclei of the gametes. In Ceratiomyxa Dr. Jahn was the first to observe the division of nuclei in the young sporophores prior to spore-formation; this was found to be a reduction division, and took place during the "network" stage of the maturing sporophore. To illustrate these observations lantern slides taken from the preparations lent by Dr. Jahn were shown on the screen, as well as a series of slides showing the more striking forms of sporangia met with among the Mycetozoa. Microscopical preparations and drawings illustrating the development of Ceratiomyxa and other Mycetozoa were exhibited by Miss Lister, and also a number of drawings and specimens of the principal genera.

Annotations.

"Ne quid nimis."

MILK PROBLEMS.

THE issue of a work [1] which on the authority of the Medical Research Committee (National Health Insurance) gives a general view of the state of knowledge on the subject of milk in its relations to public health will attract considerable attention; it may do much to clear the air and help us in regard to the problems still ahead. Milk problems are full of difficulty, and it is well to have before us the data in a collected form, which will enable us to appreciate exactly the position. Such a stocktaking is necessary from time to time in many matters where public considerations and scientific procedures meet, and the Medical Research Committee were well advised to choose the milk question as one of the first importance to elucidate, so far as researches and experience have gone. With this object in view they invited Dr. Janet E. Lane-Claypon, assistant medical inspector under the Local Government Board—who, our readers may remember, made valuable reports upon certain portions of the subject in 1911—to collect all the known materials and to make any comment which her wide experience enabled her serviceably to do. It is quite obvious that with the ominous position of infant mortality, when war also is sacrificing lives on a very serious scale, particular attention should be directed to nutritional questions in regard to milk the replies to which may save thousands of infant lives. Infant nutrition needs to be more seriously taken in hand than ever before, and it is somewhat of a reproach to our scientific observers that the present state of our knowledge is not more satisfactory. We know that infant mortality bears a decided relationship to methods of defective feeding, but we are still in need of more accurate information in combating the waste of life from this cause. Physiology, chemistry, bacteriology, and other branches of science have been equally appealed to for assistance, and a certain amount of real practical help has been furnished, but we still lose too many children from what, for want of a better name, we call malnutrition. When it is considered that milk is merely an emulsion of fat, associated with proteins, carbohydrate, and mineral salts, the constitution of which is definitely known, the physiological chemistry would appear to be simple. It is not, however, the chemistry alone of milk that is concerned, for milk is not made in the chemical factory, but is the product of a highly organised mechanism in which so many vital factors are concerned. Dr. Lane-Claypon is inclined to discount any vitalistic theory in regard to the efficiency of natural milk as a constructive in infant feeding. Thus in reviewing the subject she refers to the "so-called" biological properties of milk, to the "alleged" production of Barlow's disease and rickets by the use of heated milk for infants, and to vitamine theories which give results that are "somewhat fragmentary." But she admits that milk contains substances of (at present) unknown composition which are essential for the life of the animal where milk is the sole dietary, adding that there is no evidence to show that these substances are destroyed by boiling, especially when the heat is not applied for prolonged periods and when a temperature not exceeding boiling point is used. The loss of vitamine, she says, if it occurs, is evidently not sufficient to affect the nutritive value of milk, "as has been abundantly shown in the preceding chapters." This statement in defence of boiled milk would appear to indicate that Dr. Lane-Claypon regards the retention of vitamines intact as important and that no objection can be made to boiling inasmuch as this process does not destroy these substances. The report threatens to revive the whole controversy of the merits and demerits of boiled milk, in connexion with which, amongst other matters, the facts collected in this volume give valuable evidence. It is noteworthy that Dr. Lane-Claypon dismisses practically all biological influences, so that enzymes or ferments are ruled out as playing any possible rôle in nutrition. These conclusions do not on their face appear to harmonise with modern work on the subject of nutrition, nor do they quite fit in with the view that ferments or enzymes are essential as activators in the great nutritive processes. Recent observations tend to show that a chemically ideal or physiologically balanced diet does not necessarily nourish its consumer unless there are present certain substances; while it is difficult to believe, to take a familiar example, that a hard-boiled egg, with its albumin stiffly coagulated, can be dietetically as serviceable as a raw or lightly cooked egg. Too much stress, however, cannot be laid on this argument, as one of the first stages in the natural digestion of milk is the coagulation of the caseinogen. But research has in fact shown, as we should expect, that from an absorption point of view all is in favour of the raw egg, while boiled milk means that multiple changes take place not only in regard to the albumin of the fluid, but also to its other constituents. Boiling as a safeguard against bacterial infection is, of course, sound enough, but it cannot be that milk so treated is chemically, physiologically, or physically the same as the milk direct from the breast. Yet, in spite of these considerations, the evidence of practical experience appears to show that certainly in a large number of cases milk does not lose any of its nutritive value by boiling. Dr. Lane-Claypon shows that some children thrive better on raw milk, others on boiled milk, and therefore we must conclude that individuality is a grand factor in the situation.

[1] Milk, and its Hygienic Relations. By Janet E. Lane-Claypon, M.D., D.Sc. Lond. Published under the direction of the Medical Research Committee (National Health Insurance). London: Longmans, Green, and Co. 1916. Pp. 348. Price 7s. 6d. net.

THE INFLUENCE OF SPINAL ANÆSTHESIA ON BLOOD PRESSURE.

SPINAL anæsthesia is not so generally adopted as perhaps it deserves to be owing to the variable and contradictory results obtained, some surgeons having, after repeated trials, abandoned the method. In order to ascertain whether spinal anæsthesia has any undesirable effect on the blood pressure in comparison with general anæsthesia by ether and chloroform, Dr. Pietro Amaglio made a series of observations which are recorded in *Il Morgagni* (Part 1, No. 5, May 31st, 1916). The anæsthetic used was a 5 to 10 per cent. solution of novocaine, and observations were made with a Riva-Rocci sphygmomanometer on 37 cases. It was found that the arterial pressure was sensibly affected in 16 of the cases, in some slightly, not exceeding a diminution of 5 mm. and of small duration, returning to normal towards the

end of the operation with the gradual return of sensation; in others the effect was more decided and persistent, a diminution of 15–20 mm. requiring injections of infundibulin and camphor to restore it. The maximum observed was a diminution of 45 mm. In the remaining 21 cases there was no appreciable effect on the arterial blood pressure. These results are somewhat different from those of Solaro and Borghi, who recorded a rapid and constant lowering of blood pressure of 10–50 mm. These observers, however, used a mixture of stovaine and novocaine. From a general point of view, therefore, it may be accepted that spinal anæsthesia by novocaine alone has little influence on the arterial pressure, and that in those cases in which it is affected the lowering is usually transitory, and that when it is persistent the administration of the usual remedies will restore it to normal in a short time, varying from a few hours to a maximum of 24. Dr. Amaglio considers that spinal anæsthesia by novocaine merits a more extensive practical application in view of the researches of Dialti and Pozzilli on the influence of ether and chloroform narcosis on the blood pressure, which was decided. For whereas in ether narcosis there is a preliminary period of a marked rise in arterial pressure which then returns slowly to normal, chloroform narcosis, on the other hand, produces from the commencement a noticeable lowering, which is sometimes restored after a longer or shorter time, but which at other times persists or becomes so accentuated as to threaten life. Ether being in this respect preferable to chloroform, by comparison spinal anæsthesia having very slight influence on the blood pressure should be logically preferable to either.

THE CARNEGIE UNITED KINGDOM TRUST AND INFANT AND MATERNAL WELFARE.

WE understand that the Carnegie United Kingdom Trust, desirous of obtaining a comprehensive report upon the provision made throughout the country for promoting the physical welfare of mothers and infants, have prepared a schedule containing a large number of questions indicating the scope of the inquiry and the aspects of the subject upon which information is sought. Copies of this schedule have been sent to the medical officers of health of the larger sanitary districts, together with a copy of a letter signed by Dr. E. W. Hope, the medical officer of health of Liverpool, requesting that the required information should be sent to him in order that the Carnegie trustees "may be in a position to decide what steps of a practical nature can be taken by them (if any), and generally to assist in the solution of the problems in question." The schedule, which covers the ground in a fairly comprehensive manner, is divided into seven sections. Section A contains inquiries into the general sanitary condition of the district. Section B concerns itself with the activities of local authorities with special reference to infant and maternal welfare; while Section C requires similar information in respect to the activities of voluntary agencies. Section D is devoted to the Poor-law aspect of the question; Section E to information connected with midwives; Section F to education in mothercraft, and under Section G space is provided for general observations by the medical officer of health of the district. It is satisfactory to know that the Carnegie trustees are taking a practical interest in the very important subject of infant and maternal welfare, and that they have apparently placed the matter in the hands of Dr. Hope in order that he may draw up a report on the matter; but we must, at the same time, express surprise at the manner of conducting the inquiry. We should have thought that all the required information would have been in the possession of the Local Government Board, and that it might have been obtained from them direct without troubling medical officers of health to fill up special inquiry forms for the Carnegie trustees giving information which these officers have doubtless already supplied to the central public health authority. Medical officers of health have nowadays a very large number of official returns to fill up—some think far too many—and, at the present time, when most of them are short of staff owing to the exigencies of war, it is rather surprising that this additional, and, as it seems to us, unnecessary, burden is sought to be placed upon them. Dr. Hope's letter to the medical officers of health of the districts to which the schedule of inquiry has been sent is vague as to the use to which the Carnegie trustees intend to put the information on infant and maternal welfare once they have got it, and it is unfortunate that he was not a little more explicit on the point. This branch of public health work is at present under the control of two Government departments—i.e., the Local Government Board and Board of Education—both of which are empowered to make grants of public money to assist in financing local schemes. It is to be hoped that the Carnegie trustees do not intend to make an already complicated position more complicated; the proverb of too many cooks spoiling the broth is none the less true because it is trite, and it would be sad if it became applicable to the activities of those who have at heart the welfare of mothers and children in this country.

EMPYEMA AFTER PNEUMONIA.

PNEUMONIA is without doubt the commonest cause of empyema. Empyema is no less one of the commonest sequels of pneumonia. Dr. G. Nilson[1] has met with 32 cases of empyema among 465 patients treated for pneumonia at the Karlskrona Seamen's Hospital between the years 1903 and 1915, and discusses the treatment of the condition. Borelius, describing in 1914 34 cases of metapneumonic empyema met with at Lund, found that 12 recovered after a single thoracocentesis and withdrawal of the pleural exudate, while 5 more recovered after repeated pleural puncture; the remaining 17 required operation, the removal of a piece of a rib. The average durations of these treatments were 37 days, 107 days, and 52 days respectively, and Borelius came to the conclusion that primary thoracotomy, the resection of a piece of a rib, should therefore be regarded as the normal treatment of such empyemas. In describing his own experience Dr. Nilson remarks that certain years, such as 1903, 1909, and 1915, impress themselves as "pneumonia years" in the personnel of the navy, and also as "empyema years." During such years the cases of pneumonia averaged 60 instead of the usual 35, and the percentage developing empyema rose from the average 7 per cent. to 11 per cent. The empyema declares itself four or five weeks, on the average, after the beginning of the pneumonia; the three earliest

[1] Nordiskt med. Arkiv, Stockholm, 1915, xlviii., Afd. I., Kirurgi, hft. 2.

cases occurred 8, 9, and 11 days respectively after the onset. Borelius lost 7 out of his 34 cases of empyema; Dr. Nilson lost 3 out of his 32, 1 from spread of pneumonia to the other lung, 1 from multiple arthritis and heart failure, and 1 died suddenly during apparent convalescence two months after the operation, death being due to embolism of the pulmonary artery by a clot from the left hypogastric vein. In operating for empyema, Dr. Nilson resects four or five inches of rib, and clears out any collections of fibrin he may be able to reach in the cavity. Recovery, he finds, takes place in 13 weeks, on the average, but is more rapid in the cases with small collections of pus, and slower in those with large collections. Thus in 3 of his 32 patients the amount of pus in the pleural cavity was less than one litre; one patient died, the other two recovered in 7 or 8 weeks. In 18 cases the pus amounted to between one and two litres; the average duration of the post-operative treatment was 12 weeks. In 9 instances the quantity of the pus was between two and three and a half litres, and the after-treatment averaged 16 weeks in length. One patient yielded four and a half litres of pus, and was still under treatment 19 weeks later; one patient yielded seven litres, or 12 pints, of pus, and recovered in 24 weeks. Dr. Nilson's patients were mostly young men aged between 20 and 28; he remarks that 3 died, 2 were still under treatment when he wrote, and that the remaining 27 made good recoveries and did not require any thoracoplastic operations for failure of the lung to expand. He concludes that his figures prove the advisability of treating metapneumonic empyema in adults by primary resection of a rib, while thoracocentesis may prove satisfactory in the cases of children with small empyemas after pneumonia or with pleural exudates that are almost serous in character.

THE INSUFFLATION OF SULPHUR IN THROAT AFFECTIONS.

BLOWING flowers of sulphur on to a throat exudation was probably a not unusual remedy among medical men in the past, although on the authority of Professor C. G. Bäumler[1] it was first recommended by Legauterre in 1866. The proceeding seems to have fallen into disrepute in the metropolis about the time when the first hospitals of the Asylums Board were being opened in the "seventies." Sulphur, although attacked by living protoplasm, is probably quite unaltered by a mucous membrane—Bruce and Dilling state categorically that it remains unaltered in the stomach—and the application partook more of the nature of a rite than of serious treatment; it was akin to placing a stick of solid sulphur in a dog's drinking water which was at one time supposed to protect the animal from eczema. Doubtless the insufflation of sulphur persisted longer outside London and as a popular remedy. A letter in THE LANCET of Jan. 26th, 1895, compares the efficacy of sulphur and antitoxin in the treatment of diphtheria, concluding in favour of the former, and the following issue contained a statement by another correspondent to the effect that "sulphur is a most excellent remedy in all ulcerative throat affections." Quite recently Sir William Whitla states in the latest edition of his "Elements of Pharmacy": "Sulphur is a popular local application to the false membrane in diphtheria, either as a gargle or insufflation." It is therefore not altogether surprising to have a tragic reminder of its possible evil consequences in the report of a recent inquest at Newport (Mon.) at which medical evidence was given to show that the death of a girl of 9 years was due to asphyxia caused by the presence in the larynx of flowers of sulphur which had been blown there by the girl's mother who had heard of it as a remedy for diphtheria. Dr. Rees Morgan, who made the post-mortem examination, informs us that the practice in question is still quite common in South Wales and Monmouthshire. Some sulphur is shaken on a sheet of paper, which is then rolled up into a tube, one end of which is placed as far as possible down the patient's throat while the operator blows into the other end. Now that publicity has been given to the danger of the practice as well as to its uselessness, it will, we hope, die out altogether.

[1] On the Use of Sublimed Sulphur as a Local Application in Diphtheria, Brit. Med. Jour., March 3rd, 1894, p. 459.

THE METROPOLITAN WATER-SUPPLY.

MARCH, like February, was on the whole a wet month, the mean rainfall at 12 stations which have been selected as giving equal representation for all parts of the Thames basin being 4·58 inches, which is 2·47 inches above the average mean rainfall for this month during the previous 33 years. The result was a deterioration of the raw river waters, as judged by the albuminoid nitrogen, permanganate, turbidity, and colour tests. Similarly, the filtered waters showed some falling off or showed no change by chemical tests or in regard to colour. The filtered waters, however, generally speaking, showed a high standard, and whereas 100·0, 100·0, and 34·8 per cent. of the samples of raw Thames, Lee, and New River water respectively contained typical B. coli in one cubic centimetre (or less) of water, 81·7, 69·6, and 65·5 per cent. of the filtered water samples derived from the Thames, Lee, and New River respectively contained no typical B. coli even in 100 times as much water—namely, 100 cubic centimetres. The efficiency of the storage and filtration processes is thus again made evident and the metropolis enjoys an immunity from water-borne disease.

HERPES ZOSTER AND VARICELLA.

IN the *British Journal of Dermatology* for January–March of this year is an article by Dr. F. Parkes Weber on two cases of herpes zoster associated with a generalised eruption of varicella-like spots. From the précis of the literature given by Dr. Parkes Weber it can be gathered that such cases are not infrequent and constitute a group of considerable interest and not a little obscurity. The first case is that of a male aged 59, suffering from chronic lymphatic leukæmia, who after a fortnight's treatment with arsacetin developed an eruption of typical herpes zoster over the right shoulder. Five days later a generalised but scanty eruption of varicella-like spots appeared; they were scattered about the trunk and gradually disappeared without causing any trouble, whereas the zoster was followed by depressed scars covered with dark scabs. The second case was a woman aged 60, who developed typical herpes zoster in the distribution of the left trigeminal nerve. The attack was severe, the herpes soon becoming confluent and partly hæmorrhagic, with much œdema of the whole face. The preauricular glands and those along the anterior border of the sternomastoid were very

enlarged and tender. After a week a generalised vesicular eruption like varicella, very scattered, appeared over the trunk and extremities. It vanished gradually after some two weeks, but the herpes did not disappear completely till some two months had elapsed. In some of the recorded instances the so-called varicella has preceded the outbreak of the herpes zoster, in others the two have been practically synchronous, while in others still the varicella has been subsequent to the herpes, as in Dr. Parkes Weber's cases. Were it merely a question of the two conditions occurring thus together or in close relation to each other, the problem would be less baffling than it will be seen to become when the following additional facts are borne in mind. In some cases reported by Bokay at the International Medical Congress of 1909 (Budapest) one child in a family developed typical varicella ten days after an eruption of herpes zoster in another child in the same family. A considerable number of such cases have been put on record: zoster following varicella in different members of the same family or varicella following zoster. Further, in some cases of apparently ordinary varicella the rash shows local zoster-like grouping of the vesicles, which may be associated with pain. Various hypotheses have been put forward to account for these curious phenomena. It has been suggested, to begin with, that herpes zoster and varicella are due to identically the same cause or morbid agent, some as yet unrecognised virus or organism. If this were so, as Dr. Parkes Weber remarks, we should expect to find frequent cases of herpes in varicella epidemics. As a matter of clinical fact this association is not found. Nor is the association of herpes and varicella in the same individual noted as an occurrence in epidemics of the latter. Again, in many cases of herpes of the symptomatic variety it seems possible to exclude the action of any varicella virus, in the sense that the herpes is adequately accounted for otherwise. Heim has suggested that the unknown microbe of varicella may under certain as yet obscure conditions give rise to a localised eruption resembling herpes zoster, and that this again may further give rise to a varicella-like rash. There is, it may be remarked, no *a priori* reason why true herpes zoster and true varicella should not occur more or less simultaneously in the same individual; some, at least, of the reported instances might thus be explained. It should be borne in mind, also, that histological evidence shows that the spinal manifestations of herpes zoster, while in part definitely localised, are also diffuse, and it is therefore quite conceivable that in certain cases the rare and scattered varicella-like vesicles accompanying an attack of zoster are due to diffusion of the herpetic virus in the nervous system. In this connexion the analogy of acute poliomyelitis is instructive; the manifestations of the virus of that disease are diffuse, although it is undoubtedly massed in the ventral cornua. Sometimes the virus of poliomyelitis "overflows" and sensory phenomena result; sometimes the postulated virus of herpes overflows and motor phenomena result. Perhaps the chief difficulty in the whole question of the possible relation of herpes zoster and varicella is one of interpretation. Thus one observer in a case of herpes with generalised eruption said that the eruption "looked like" a bad attack of varicella. There is the problem. A typical case of herpes zoster and a classical case of varicella occasion no diagnostic hesitation; but when varicella is clustered, and when herpes is diffluent or scattered, difficulties arise. On the margins of the affected segmental cutaneous area or areas in herpes the clinician will not infrequently find more or less isolated vesicles, but these do not embarrass him because of the massing of the rest of the eruption. A consideration of the interesting data which Dr. Parkes Weber has collected serves to accentuate the feeling that light will be thrown on not a few of the hitherto insufficiently studied exanthemata by research along the lines of their serology and the condition of the cerebro-spinal fluid in such cases, and that the occasional nervous symptoms and accompaniments of the exanthemata are of greater significance than their rarity leads the observer to suppose.

ANNUAL REPORT FOR 1914 OF THE REGISTRAR-GENERAL.

BY JOHN F. W. TATHAM, M.A., M.D.DUB., F.R.C.P.LOND. & IREL., D.P.H., &C.,
LATE SUPERINTENDENT OF STATISTICS, GENERAL REGISTER OFFICE.

II.[1]

Standardised Death-rates.

IN the reports of the Registrar-General issued since the last Census the term "standard death-rate" has been substituted for the term "corrected death-rate" previously employed in this country. This change has been made at the suggestion of Dr. Cressy Wilbur, chief statistician to the American Census Bureau, who applied it in the compilation of the Census Bulletins for 1911. In that document reasons are given for the adoption by the Bureau of the population of England and Wales in 1901 as the standard of correction for the death-rates. Dr. Stevenson's arguments in favour of this substitution will be found in the official report for the Census year.

In a condensed table in the report for 1914 both the crude and the standardised death-rates are stated without reference to age or cause in each of the four groups of geographical areas employed in these reports. The rates are also given for the preceding year and for the quinquennium 1906–10. In another table the mortalities are shown of the various sex- and age-groups from which the standardised rates are calculated and a third table compares the mortality by sex and age in the various classes of area with that of England and Wales generally.

As the constitution of the English population in 1914 was less favourable to low mortality than in 1901 standardisation of the death-rates on the basis of the latter year slightly reduces the rate of the whole country. The effect upon London and the smaller urban districts is insignificant, but the mortality of the county boroughs is increased by 3 per cent., whilst that of the rural districts is diminished by 15 per cent., the contrast between them being thus materially increased. Outside the metropolis mortality increases generally with urbanisation, but the mortality of London is intermediate between that of the county boroughs and that of the smaller urban districts, and in the case of females is even lower than that of the urban districts as a whole. This is equally true of the four years 1911–14. As in the three preceding years, the proportional as well as the actual excess of male mortality was least in the rural districts and increased with urbanisation to a maximum in London. The evidence is therefore consistent that urban conditions tell more severely on males than on females.

In a further table comparison is made of the mortality experienced in the North, the Midlands, and the South of England and in Wales with distinction of sex, age, and class of area. It shows, as did similar tables for the three preceding years, that the standardised death-rates of the north at all ages considerably exceed those of other parts of England. Mortality in Wales falls, as usual, between that of the north and that of the remainder of the country.

The detailed abstracts for 1914, which bulk largely in this volume, show the causes of death of males and females at 27 groups of ages for the whole of England and for its

[1] No. I. was published in THE LANCET, June 24th, 1916, p. 1271.

several geographical divisions. The tables in this report are arranged according to the short list of causes adopted by the Registrar-General and the Local Government Board. These tables are identical in form with the Board's Table III., and are common to the reports of both authorities.

Classification of Causes of Death

For many years past attempts have been made in the General Register Office to improve the classification of causes of death. Inquiries still continue to be addressed to medical practitioners with the object of eliciting fuller information respecting deaths the causes of which are unsatisfactorily stated in the certificates.

Since 1911 similar inquiries have been made to coroners. As many indefinite certificates are received regarding deaths that have been investigated by coroners' juries, it has been decided to ascertain whether definite information not embodied in the verdict might be obtained from the medical evidence at the inquest. Thanks to the courtesy of coroners, this has been proved to have been so in many instances—deaths certified as due to syncope, natural causes, &c., having been referred in the records to official headings on the strength of excerpts furnished from the medical evidence. Many years ago similar attempts were made to obtain this information, but for reasons which have not been stated those attempts were unsuccessful.

In order at once to facilitate inquiries and if possible to diminish their number in future, a list of indefinite forms of certificate, with indications of the further information desirable in each case, is distributed with the inquiries and is bound up with the books of death certificate forms officially issued. By this means the supplemental information desired in any given case is readily indicated; moreover it has been found that the number of deaths imperfectly certified has fallen appreciably since the list came into use. Referring to this topic in a recent report Dr. Stevenson quotes a number of instances in which the issue of these inquiries renders it possible to ascertain the meaning attached by practitioners to their use of various conveniently indefinite terms. He observes that these are questions in regard to which no assistance can be expected from nomenclatures or from text-books, for it is the function of these to discourage, not to define, the use of such expressions. And even if the meaning rightly attaching to such terms could be laid down by authority, this would not necessarily supply the answer to the question which the tabulator must ask himself—viz., "What does this expression mean to the man who has used it?" This question can only be answered by reply to inquiry directed to the user himself.

Several instances are related of improvement in classification resulting from these inquiries. Thus in many cases originally attributed to tuberculosis the deaths are ultimately classed as due to the pulmonary form of that disease, whilst in other cases indefinitely referred to rheumatism the classification eventually reached is "rheumatic fever." Further instances of improvement are indicated in the following statement of deaths registered in 1914:—

Originally Certified.	*Finally Classified.*
253 from cereb.-sp. men. or basal meningitis.	116 to cereb.-sp. fev., 51 to tubercular meningitis.
203 from fibroid phthisis.	121 to pulmonary tuberculosis
376 from cerebral tumour.	13 to tub. men., 23 to syphilis, 35 to cancer.
897 from cancer (indefinite).	In 809 cases to part or organ affected.
376 from peritonitis.	21 to tub. perito., 67 to appendicitis.
298 from syncope, heart failure.	122 to definite heart disease.
1306 from other indefinite causes.	In 982 cases classification has been improved.

By this system, which has been in operation for many years, the accuracy of the returns of causes of death is being constantly improved, and as the Registrar-General is dependent in regard thereto upon the goodwill of medical practitioners, Dr. Stevenson very properly acknowledges the services thus willingly rendered.

Enteric Fever.

The loss of life from this disease has been less since the last Census than in any previous period on record. The death-rate in 1914 was 46 per 1,000,000. In no year before 1905 had the rate stood at less than twice its present amount. From a public health view-point the significant fall in enteric fever mortality will naturally be claimed as proof of the efficiency of modern sanitation. But the fall has been so remarkable as to suggest resort to further investigation. The vast experience of the Metropolitan Asylums Board goes to show that amongst the admissions for enteric fever there are a very large proportion of cases which are not really examples of that disease. Again, evidence has recently been adduced of the existence of considerable alteration of fashion as regards the nomenclature of typhoid-like diseases. These considerations should have weight in relation to the present matter.

The three counties with highest enteric fever mortality in 1914 were Durham, the West Riding of Yorkshire, and Northumberland, and the three county boroughs were Devonport, Wigan, and Hull. Durham, the county of highest mortality in 1914, was fifth highest in 1912 and 1913, while Devonport, the county borough of highest mortality in 1914, was second in the previous year and first in 1912. These figures confirm the conclusion drawn on previous occasions that the maintenance of enteric fever mortality at its present level is largely due to the relatively backward position of a small number of areas.

Scarlet Fever.

The deaths from this disease in 1914 were equal to a rate of 77 per 1,000,000 at all ages and of 229 per 1,000,000 at ages under 15 years. Very remarkable is the decline in mortality from this disease which has taken place during the last half-century. Until 1895 no year experienced a mortality less than double that of the year under notice. Viewed from the standpoint of the deaths alone it might be thought that the disease was tending to disappear entirely. But the notification returns prove that it is still widely prevalent, the diminished mortality corresponding to mildness of type of the disease which contrasts sharply with the type prevailing a generation ago.

The towns yielding the highest death-rates from scarlet fever were Preston, Oldham, Salford, Warrington, and Middlesbrough, and of these Preston, Warrington, and Middlesbrough have returned rates above the average for county boroughs in each of the last three years. This tendency to persistently higher mortality year after year in the same locality is similar to what obtains in the case of enteric fever, and contrasts strongly with the behaviour of measles and whooping-cough, which seldom furnish high rates of mortality for three consecutive years in the same district. The explanation doubtless lies in the fact that the proportion of children attacked by scarlet fever is much below the proportion for measles and whooping-cough, so that after even a severe outbreak the majority would generally be unprotected by a previous attack. This applies still more to enteric fever; whereas a severe outbreak of measles or of whooping-cough limits itself by almost exhausting the supply of susceptible children.

The fatality of this disease is not given in the present report, but in the year 1912 it amounted to 19 per 1000 cases reported. The fatality in London, where 94 per cent. of all the deaths occurred in hospitals, may be compared with the experience of the Metropolitan Asylums Board. During 1912 the fatality in the Board's hospitals was 1·6 per cent. of the cases treated, as against 1·5 per cent. among notified cases treated at home. The ratio of hospital deaths per cent. of admissions has gradually fallen from 13·1 in 1876–80 to 2·7 per cent. in 1906–10. The type of disease in London was mild in 1912 even beyond the average of recent years.

Diphtheria and Croup.

The deaths thus returned in 1914 correspond to a rate of 160 per 1,000,000 at all ages—the mortality at ages under 15 being equal to 501 per 1,000,000 at those ages. Very decided is the effect of standardisation upon the death-rate at all ages. All the crude diphtheria rates require increase to render them fairly comparable with those of 1901, on account of the diminished proportion of children now living. Middlesbrough, Great Yarmouth, Northampton, Devonport, and Portsmouth were the towns of highest mortality, the last three of them having exceeded the average for each of the last four years. The fatality of diphtheria, like that of most other infectious diseases of early life, decreases rapidly with age. In the experience of the Metropolitan Asylums Board during the Census year it decreased from 342 per 1000 admissions under 1 year of age to 22 per 1000 at ages

10–15. The ages at which attack occurs therefore largely influences the fatality. In the year 1911 nearly half the deaths from diphtheria and croup occurred in public hospitals.

Tuberculosis.

The general death-rate from tuberculous affections in the aggregate was 1361 per 1,000,000 living, which is less than that of any previous year except 1913. The deaths from that disease were equal to 9·7 per cent. of the total deaths. The death-rate has fallen to this figure notwithstanding a change in the constitution of the population which favours tuberculous mortality. Compared with the average rate for 1906–10 the standardised mortality in 1914 shows a reduction of nearly 14 per cent. For the population generally and for the male sex tuberculosis mortality varied in the same way with urbanisation, from a maximum in London to a minimum in the rural districts, but a higher mortality for women was recorded in the county boroughs than in London. The excess of female mortality in the county boroughs over that in the rural districts was 39 per cent.; but for males the excess of the London rate over that of the rural districts was 114 per cent. It is therefore evident that urban conditions of life increase the risk of tubercle much more for males than for females.

A PORTABLE FRACTURE BOX

FOR USE IN FIELD AMBULANCES AND FIELD HOSPITALS.

BY ST. J. DUDLEY BUXTON, M.R.C.S., L.R.C.P., B.S.LOND.,
CAPTAIN, R.A.M.C.

THE field fracture box in the equipment of each section of a field ambulance has been proved by experience to be out of date. Its contents have been found unsuitable for the treatment of fractures due to gunshot wounds; plaster-of-Paris, now little used in field hospitals, adds considerably to the box's total weight of 82 lb. It has been customary of late to send up to units large numbers of additional splints, and when field units are stationary this system has not many disadvantages. However, in some fighting areas it is necessary for all equipment to be carried on mules, and for these reasons I have collected and put together such splints as I consider most practical in the treatment of gunshot wounds involving bones, so that they can be carried by mule transport.

Major E. B. Waggett, R.A.M.C. (T.F.), recently made a fracture box which weighed about 60 lb. It was suited for those who worked with him, but did not contain several simple appliances which others would look for in a fracture box. The box I am about to describe is much heavier (90 lb.), but the weight could at any time be lessened by throwing aside articles which some might consider dispensable under the circumstances in which they were placed. This weight is of no disadvantage if the fracture box is conveyed in the medical store cart, and when carried on a mule it can be counter-balanced by the medical comfort pannier, carried also in the medical store cart. Such a weight of 180 lb. in addition to pack-saddlery is not the greatest weight some of the pack-mules are able to carry.

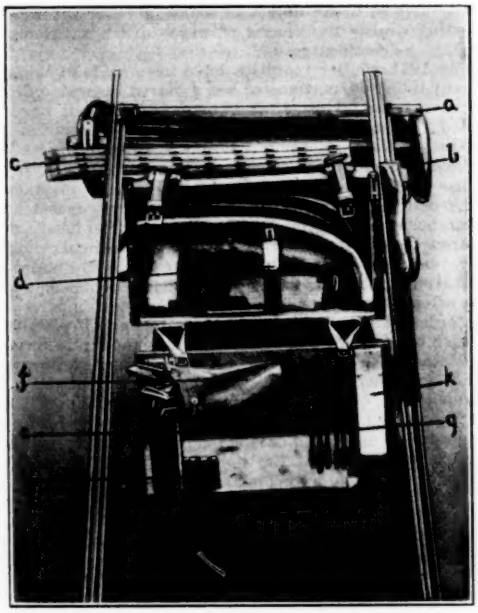
The box was made and fitted in the field ambulance and all splinting and contents are such as can be obtained from a depôt of medical stores. The box itself measures 22 by 12 inches, and is 16 inches deep; these are inside measurements. It is made of $\frac{3}{8}$-inch wood with the ends of $\frac{7}{8}$-inch wood; it is strengthened by iron girders where the ends and sides are joined, and by wood girders (3 inches broad) $2\frac{1}{2}$ inches from each end. To each wood girder is screwed a 1-inch leather strap and buckle, 7 feet 6 inches long. This completely encircles the box, but is not fixed to the lid, and allows loose splints to be fixed on to the lid. Metal rings are attached to the leather for mule transport. A strong handle of thick canvas carpet binding is fastened on each end of the box, to allow of hand carriage.

The lid fits tightly, but can be removed quickly by canvas loops tacked to it inside, which protrude when the lid is in position.

On the inside of the lid (see figure) the following are attached: 1. An inch rule is painted. 2. Bag of tools containing shears (3 inch), saw and cutting pliers (as supplied in field fracture box for aluminium work), hammer and nails. 3. Six iron interruptions (7 inch) for long Liston splint, and screws. 4. Metal slot for bending aluminium strips, as in field fracture box. 5. List of contents of box.

Contents of box (see figure).—Tow, 4 lb.; triangular bandages, 150; straps and buckles, 60; tape, 2 packets; sand-bags (20 inches long), 30; safety-pin boxes, 3; old sheet; rubber adhesive plaster (7 inch) tins, 3, (2 inch) rolls, 2.

Splinting material.—*Aluminium strips, 60-inch lengths 4, 18-inch lengths 5; aluminium ribbon rolls, 3; *Gooch splinting, roll, 1, assorted, bag, 1; vulcanite fibre, sheets, 3; pasteboard, bag, 1.



Showing the fracture box open and the inside of the lid. *a*, Back splint; *b*, Thomas's splint; *c*, aluminium strips; *d*, plaster adhesive; *e*, lid; *f*, tool case; *g*, iron interruptions for Liston's splints shown on each side; *h*, metal slot for aluminium work; *k*, list of contents.

Splints.—Arm: Angular arm (for internal or external), wood, 4 (N.B.—These splints can also be used for side splints for leg and foot, one arm being longer than the other); angular arm, wire, 3; straight, wire, 4; wrist, for dorsi-flexion of wrist and hyperextension of fingers, iron, 1; Carr's splint, 2.

Leg: *Thomas's knee-splint, 3; *long Liston's splint, 8; Cline's splint, 4 pairs; *back splint and foot-piece, 3.

* These splints are too long to go within the box, and are fixed beneath the encircling straps.

The difficulty of carrying a number of Thomas's knee-splints is known by everyone, and this is augmented by a supply of heavy ones. There are three with this fracture box, but more could be carried if light ones were obtainable. Some supplied weigh $7\frac{1}{2}$ lb., but this is excessive. In places the A.O.D. have made these splints weighing only $2\frac{1}{2}$ lb., and of this kind more can be carried. The long Liston cannot be dispensed with, owing to this difficulty of carrying Thomas's splints, and it is made of wood useful for the manufacture of other shorter splints. Only 4 lb. of tow are included since plenty is carried in a G.S. pannier. For the same reason the number of carpentering tools is limited, since screwdriver, saw, &c., are contained in a G.S. pannier.

My thanks are due to Captain G. W. Harris for the photograph from which the figure is reproduced.

PRESENTATION TO A MEDICAL OFFICER.—Captain Alexander Findlater, R.A.M.C. (T.), medical officer of the Hendon Union, has been presented by the residents in Edgware, Stanmore, and the district with a purse and an illuminated address in recognition of his having won the D.S.O. for conspicuous gallantry while serving in Gallipoli.

ORDER OF THE EXCELLENT CROP.—Dr. J. R. Watson has been granted His Majesty's Royal licence to wear the Order of the Excellent Crop of the Sixth Class conferred upon him by the late President of the Republic of China in recognition of valuable services rendered.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Scottish Midwives Association Formed.

AT a representative meeting of Scottish midwives held in Edinburgh last week, Dr. Laura Stewart Sandeman presiding, it was unanimously approved that an association should be formed, called "Scottish Midwives Association," and a committee was appointed to make the initial arrangements.

The Edinburgh Medical Guild.

The Edinburgh Medical Guild has recently sent to the press for publication the following résumé of the objects which it exists to provide: (1) The same free choice of doctor for the insured person as in private practice; (2) freedom from any contract other than the moral obligation of the doctor to his private patient; (3) the same supply and quality of medicines for insured as for private patients; and (4) protection against the abuse which can be made of the corresponding provisions under the present Acts, consisting in wholesale "contracting out" and the formation of medical aid institutes.

A Catgut Industry in Edinburgh.

A factory has been established in Edinburgh for the manufacture of surgical catgut ligatures. The catgut used in this country prior to August, 1914, came from Germany, and since that date American gut has largely taken its place. The reports as to the quality of the Edinburgh product are encouraging. A number of leading Edinburgh surgeons have used it with satisfactory results in the wards of the Royal Infirmary, and it is also being supplied to the London and other hospitals. The manufacturer states that after extended experiments he has found it impossible to produce from catgut obtained under septic conditions a sterile ligature, by means of subsequent medication after the strings have been twisted and dried, without to some extent altering the character of the gut and impairing its tensile strength. The strength of the chemical solutions which require to be used and the length of time it is necessary to allow the catgut to remain in contact with them cannot be otherwise than detrimental to the ligature. Much of the trouble experienced through irritation in the suture and on account of lack of uniformity of absorption has, he considers, been due to this non-scientific method of preparation of medical ligatures. The sterile ligatures are manufactured in Edinburgh from the raw intestines, selected from freshly killed animals, to the finished article ready for immediate surgical use. The director of the Royal College of Physicians' laboratory has made a favourable bacteriological report upon it.

Dundee Royal Infirmary: Annual Report.

The annual meeting of the directors of the Dundee Royal Infirmary was held on June 13th, when the yearly report was submitted. During the year up to May 15th 4030 patients were admitted to the wards; this with 322 patients remaining from the previous year brought the total of patients treated to 4352, an increase of 42 on the previous year. In the maternity department 309 were treated in the wards and 532 at their own homes. The cost per occupied bed was £70 19*s.* 1*d.*, compared with £69 19*s.* 7*d.* for last year.

June 26th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Irish Medical Association: Annual General Meeting.

THE annual general meeting of the Irish Medical Association was held on June 21st, in the Royal College of Physicians. Dr. F. W. Kidd, the outgoing President, presided at the opening, and the chair was subsequently taken by the new President, Mr. R. Marlay Blake. Mr. Blake, after a feeling allusion to the losses sustained by the Irish medical profession during the past year, referred to the recent alteration in the constitution of the association, by which the council had been diminished in size and rendered more efficient. During the year the protracted struggle with the Insurance Commissioners on the question of certification had been finished with the concession to the profession of the principle for which it had contended—that each medical man should certify for his own patient. There were still many evils to be redressed in the conditions of the Poor-law medical service. Up to the present a dispensary medical officer could be awarded a pension only as a favour and not as a right. He quoted the recent case of Mr. Kelly, of Enniscorthy, who, after 38 years' faithful service, was granted a pension of £100, promptly reduced by the board of guardians to £50 a year. In spite of such prospects, posts in the Poor-law medical service were eagerly sought for, and while there was competition guardians would continue to think it unnecessary to redress grievances. The whole question of Poor-law reform must soon receive the attention of the legislature. A Poor-law and National Insurance committee was appointed on the understanding that its activities should not in any way trespass on the functions of the Irish Medical Committee. Resolutions were carried: (1) asking the council to consider the question of Poor-law reform in relation to its medical service so as to be able to formulate the views of the profession when the contemplated legislation on this subject is introduced; and (2) recommending that the principles of the Midwives Acts (England and Scotland) should be embodied in a special Act suitable for and made applicable to Ireland. A further resolution was passed directing the council to coöperate with other medical bodies in Ireland in endeavouring to promote an agreed measure. The meeting terminated with a vote of thanks to the outgoing President.

Death of Lieutenant-Colonel Patrick J. Dempsey, M.D. R.U.I., D.L.

The death is announced at his residence, Aghadowey, on June 24th, at the age of 68, of Lieutenant-Colonel P. J. Dempsey, J.P. for the county of Londonderry. A native of the Aghadowey district, he studied at the Catholic University School of Medicine, Dublin, and at Queen's College, Belfast, graduating M.D. of the Royal University in 1876. He afterwards obtained a commission in the Royal Army Medical Corps, and served for 30 years in India, and also for two years with the Turkish army. While in India he was associated with many reforms in hospital work, and in the organisation of the Royal Army Medical Corps.

June 26th.

UNITED STATES OF AMERICA.

(FROM OUR OWN CORRESPONDENT.)

The Destruction of Lice.

THE best and cheapest way to get men free of lice with the least possible interference with their military duties is to dust them all over with naphthalin after a preliminary cleaning—if we accept the teaching of (Surgeon-General) Medical Director H. G. Beyer, of the United States Navy, who had been working in the Naval Hospital at Hamburg with the German Red Cross. Each man's clothes, he says, are disinfected by steam at low pressure (103° C.) for 40 minutes, while he has his hair cut off and is given a bath with hot water and soft soap. At bed-time he wears all his clothes and finely powdered naphthalin is introduced down his neck, between his underclothes and skin. During his sleep this evaporates and kills the lice, of which always a few survive the cleaning. This process is repeated on each of the two following nights, and the man is thus cleared of the pest at a cost for naphthalin of $\frac{5}{8}$ths of a penny merely. These disinfections have had to be done in Germany on a great scale; one is mentioned in a camp of 28,000 Russian prisoners; in another camp of Russians it was, as we know, that von Prowazek contracted the typhus fever of which he died.

The United States and the Red Cross.

The United States, warned by the experience of Europe, is preparing her Red Cross services, as I have before mentioned. Ten Red Cross base hospitals are organising to help the army, and are being formed in relation with the large civil hospitals, which will each of them probably furnish a whole hospital or a section accustomed to work together, with doctors, male and female nurses, clerks, cooks, &c., and voluntary-aid ladies as "nurses' aids." Transport sections will be organised, probably in relation to the Universities. Five small hospitals are to be prepared on the Atlantic coast as auxiliaries to the navy, it is announced by the Secretary of the Navy, Mr. Daniels, who is good

enough to take a great interest in the Naval Medical Department. He recently told a class of newly joined surgeons that the preparedness of a ship lies just as much in the medical administration as in the administration on the bridge—a novel proposition indeed; still, it cannot but have sent them to their life's work with enthusiasm.

An Act to Himself.

Either the regular position of an individual medical man is a matter of grave importance to the State, or the maxim "De minimis non curat lex" can scarcely be held to apply in the United States. J. B. enlisted in the United States navy as a bluejacket at the age of 26, and served on for 12 years. Leaving that service, he went to college to study medicine and duly qualified. He has now joined the Naval Medical Department as an acting assistant surgeon, but as he is over 40 a special Act of Parliament is being passed to regularise his appointment. Many Acts have been placed on the statute books of many nations with less reason.

As Others See Us.

The *Military Surgeon* for May has a letter from a United States surgeon working with the British army. He has one bitter complaint, and some thorough-going Englishmen may find it justifiable. In the United States he was accustomed to steam-heated rooms and he feels very uncomfortable under European conditions. "I have not been warm," he says, "since I left the steamer; there is no way to heat these houses, and the English are so fond of this rotten bone-seeking cold, that if the little 2 by 4 fireplace is steamed up in the living room, when they enter they say, 'My word! but it is stuffy,' and open go all the doors. So I have given up trying to get warm, and am trying instead to get used to the cold."

June 17th.

THE SERVICES.

ROYAL ARMY MEDICAL CORPS.

THE undermentioned are granted temporary rank whilst commanding Field Ambulances:—As Lieutenant-Colonels: Major M. F. Grant and Major G. A. K. H. Reed. As Majors: Captain G. E. Ferguson, Captain T. T. H. Robinson, Captain J. W. Lane, and Captain A. D. Fraser.

Keith W. Monsarrat (Captain, R.A.M.C. (T.F.)) to be temporary Major whilst employed with No. 37 General Hospital.

Temporary Major Reginald A. Farrar relinquishes his commission.

Temporary Captains relinquishing their commissions: G. Blacker, N. K. Wilson, and D. O'C. Finigan.

Temporary Lieutenants to be temporary Captains: A. Duncan, F. B. Chavasse, P. J. Murphy, J. J. Field, F. M. Walker, J. J. Middleton, F. J. Livingstone, J. N. Humphrey, G. A. Varian, H. B. Graham, A. B. Bateman, W. Ross, A. D. Clanchy, J. T. Armstrong, J. S. Webster, A. P. Bowdler, A. W. Cochrane, M. D. MacKenzie, T. McCririck, W. F. Blewitt, J. Loudon, J. A. MacLaren, J. W. Hutton, A. R. Green, F. J. Wheeler, H. J. MacK. Adams, A. B. Brook, T. S. Rippon, N. Tattersall, R. P. Hadden, H. E. H. Tracy, M. A. Power, W. O'Brien, H. F. Willington, H. D. Welply, R. J. Allsopp, R. A. H. Atkinson, H. R. Smith, S. S. Ball, D. T. Fraser, W. R. Hodge, A. A. Moon, A. McK. Bell, F. W. Overholt, C. L. T. Arthur, W. L. Pedlow, R. Scott, L. G. Tait, G. K. Allan, J. A. Mortimer, N. A. A. Hughes, P. C. Garrett, L. W. Evans, R. N. Porritt, D. W. Torrance, R. I. Douglas, J. B. Scott, C. A. Briscoe, F. W. Campbell, A. L. Krough, H. McKenzie, M. S. Esler, F. G. Gibbs, G. S. A. Bishop, E. W. Anderton, J. O'D. Egan, F. A. Kerr, G. A. Pringle, B. Langram, R. P. Garrow, P. G. Tuohy, J. R. Rygate, F. G. Collins, A. B. Aitken, H. Saunders, B. Hogan, R. Rutherford, R. D. Bridger, T. G. Stevens, J. G. Garson, D. Tenison, D. C. Thomas, J. J. Gibb, W. Robinson, H. R. Evans, H. McM. Donaldson, A. Vella, G. Y. Richardson, F. J. Dixon, J. Wright, F. G. H. Cooke, A. Stevenson, J. A. Wilson, H. C. M. McManus, L. H. Bryson, H. H. Tanner, J. Young, D. Mackinnon, W. K. MacDonald, G. E. Davidson, J. C. Bramwell, C. W. Bond, C. S. Gideon, J. C. McWalter, O. Bruce, W. L. Hay, J. L. A. Grout, A. Trower, E. N. Russell, A. C. Sturdy, T. G. S. Hodson, A. Murdoch, W. Enraght, J. G. Scott, A. Hallidie, H. M. Rainsford, J. L. Pearce, A. Cochrane, P. W. Moore, R. Lewis, H. G. Willis, T. Heywood, C. V. Cornish, G. F. Lang, J. R. Howitt, O. de Muth, H. F. H. Eberts, A. D. Sharp, H. C. Wert, F. S. Walcott, B. F. Macnaughton, I. D. Ramsay, J. Russell, W. W. Patton, W. F. MacDonald, F. J. Brodie, G. W. Whitman, H. S. Moore, A. R. Thomson, J. G. F. Heal, H. M. Godfrey, N. MacDonald, R. E. Johnston, J. H. Cuthbert, M. Cohen, H. L. Burton, J. R. Davies, W. B. Wamsley, L. N. Lee, E. Duke, H. W. Smartt, A. Wylie, L. E. Napier, C. E. Harrison, J. L. B. Dixon, G. B. Hillman, E. L. Jenkins, J. W. Darling, C. H. Evers, E. D. Smith, W. Parker, J. Mills, J. E. Long, T. G. King, V. Gray-Maitland, C. S. Bowker, H. H. Dunmere, E. F. Clowes, A. C. Greenwood, W. M. M. Jackson, J. Thomarson, W. J. D. Smyth, H. W. Sykes, J. C. Lavertine, F. N. B. Smartt, and F. W. Matheson.

Lieutenant C. A. Purnell relinquishes his commission on account of ill-health.

Temporary Lieutenants relinquishing their commissions: D. P. Gaussen, G. H. V. Appleby, F. H. Wheeler, W. J. V. Curtain, D. J. Cannon, R. H. Ashwin, E. Bayley, J. E. Hodson, R. Broom, E. H. B. Fox, W. A. G. Cluffe, J. E. Hewlett, J. McAvoy, F. Riley, D. Taylor, A. MacMillan, F. G. Beatty, K. Gillies, M. MacLean, A. J. Wilson, A. R. Sieveking, W. A. Milne, G. V. Worthington, J. Anderson, N. F. Rowstron, W. L. Clements, J. M. Chambers, S. L. Corry, A. E. Blackburn, F. Anderson, J. S. R. Weir, R. C. de Lacey, R. D. Mothersole, J. St. L. Kirwan, W. H. Warwick, A. L. Walters, D. Allan, A. G. Shera, J. L. Gregory, H. R. Rigby, J. F. Alexander, J. G. FitzGerald, R. Brookes, A. L. Pentland-Smith, A. H. Macklin, V. H. McWilliams, and F. J. Colling.

Temporary Honorary Lieutenants to be temporary Lieutenants: A. R. C. Doorley, R. M. de Mowbray, E. L. K. Sargent, G. N. Brandon, and W. G. Marsden.

To be temporary Lieutenants: J. A. Paterson, H. D. Gasteen, E. S. Molyneux, J. B. McMorland, F. J. McCarthy, G. W. Guthrie, G. E. Chissell, C. W. Macpherson, F. R. Fraser, H. M. Gillespie, A. E. Francis, T. G. Elsworth, H. R. Hurter, J. MacInnes, R. F. Williams, J. H. Paterson, J. Barrett, S. R. Hunter, H. W. Gush, A. E. Wynne, C. E. Bartlett, J. L. Smith, R. J. Morgan, A. Gaston, D. C. Crole, G. de H. Dawson, J. Whiteside, J. W. Watthews, A. J. Hawes, G. H. Sinclair, B. Robertson, A. Smith, R. J. Wilson, W. Sowerby, R. MacK. Morison, J. A. Gregory, J. R. M. Mackenzie, R. W. Davies, W. Fletcher, J. McD. Matheson, A. H. B. Pearce, A. Wright, E. W. Toulmin, W. B. Hendry, S. H. Scott, J. McPolin, D. Walker, J. A. Noble, H. J. Bensted, J. Byrne, H. B. Jones, L. G. Scudamore, P. J. Lydon, V. E. Sorapure, R. M. McMinn, L. E. Price, J. P. Good, A. McD. Nevin, W. McKee, J. A. Williams, H. C. Nickson, L. M. Rosten, H. E. White, A. Dangerfield, H. W. Hues, W. Niccol, J. R. Heath, F. S. Machin, B. Wood-White, A. A. Lees, H. P. Motteram, J. H. Watson, C. G. Teall, H. H. Tipping, B. J. Courtney, D. Fisher, C. S. Glegg, R. L. S. Nuthall, H. M. Sturrock, and M. Graves.

To be temporary Honorary Lieutenant: T. Jackson.

Canadian Army Medical Corps: Captains (Canadian Militia) to be temporary Captains: E. A. Robertson, T. G. Brodie, and A. F. Foss. Lieutenants to be temporary Lieutenants: T. J. Waddell, J. N. Lyons, S. Rodin, G. B. Ferguson, W. A. Murray, E. Fidlar, E. L. Steele, C. S. Tennant, and I. Vandandaigue.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps: Supplementary to Regular Units or Corps.

Major H. G. Smeeth to be temporary Lieutenant-Colonel whilst commanding a Field Ambulance. Lieutenant on probation H. S. Evans is confirmed in his rank.

TERRITORIAL FORCE.

Royal Army Medical Corps.

London Mounted Brigade Field Ambulance: Captain W. P. Thomas to be Major.

West Riding Field Ambulance: A. M. Davie, late Captain, Highland Field Ambulance, to be Captain.

Wessex Field Ambulance: To be Captains:—Lieutenant T. J. Costello and Lieutenant F. J. M. Kennedy.

South Midland Field Ambulance: Major F. J. Warwick is restored to the establishment.

East Anglian Field Ambulance: Lieutenant M. A. Cholmeley to be Captain.

London Field Ambulance: Major (temporary Lieutenant-Colonel) J. A. Masters relinquishes his temporary rank on alteration in posting. Major W. E. Miles, from T.F. Reserve, to be Major, and is seconded. Captain J. E. Sandilands relinquishes his commission on account of ill-health.

Welsh Field Ambulance: Captain E. L. Anderson to be Major.

North Midland Casualty Clearing Station: Captain E. H. Brunt to be Major.

Highland Field Ambulance: A. G. Reid to be Lieutenant.

South Midland Field Ambulance: Second Lieutenant G. C. Williams, from Unattached List, T.F., to be Lieutenant.

Attached to Units other than Medical Units.—Captain H. F. Comyn relinquishes his commission on account of ill-health.

TERRITORIAL FORCE RESERVE.

Army Medical Services.

Colonel D. Harrisson, from Assistant Director of Medical Services, West Lancs (Reserve) Division, to be Colonel. Major W. E. Miles, from a London Field Ambulance, to be Deputy Assistant Director of Medical Services, 1st London Division.

BULLETIN OF THE NAVAL MEDICAL ASSOCIATION OF JAPAN.

The November, 1915, issue of this bulletin, just received, written in the Japanese character, contains brief abstracts in English. Among the contents is an original article by Staff-Surgeon B. Shinshi on Radium Treatment of Cancer of the Œsophagus, describing the author's experiments on six cases of stricture of the œsophagus caused by cancer. In five of the cases the stricture was remarkably benefited; the sixth case ended in death without showing any improvement. In the dissection of this latter case it was noticed that the cell-group of epithelioma had lost their proper type, and the cancer cells were necrosed. The same author also describes his experiences of Abderhalden's dialysation test for the diagnosis of cancer, and remarks that according to his experience Abderhalden's dialysation test proved very useful. Fleet-Surgeon M. Yasawa records his experiences with the diathermy treatment in various diseases, Staff-Surgeon S. Matsukuma deals with chronic empyema of the maxillary sinus, and Surgeon K. Imai with the application of sensitised vaccine in relation to the mixed protective vaccine of B. typhoid, paratyphoid A and B. The method is this: to sensitised living bacilli 0·4 per cent. carbolic acid is added, the mixture being put into the incubator (37° C.) for 15 hours, which completely kills the living bacilli.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 largest English and Welsh towns with populations exceeding 50,000 persons at the last Census, 8263 births and 4196 deaths were registered during the week ended Saturday, June 24th. The annual rate of mortality in these towns, which had been 12·5, 12·0, and 12·3 per 1000 in the three preceding weeks, further rose in the week under notice to 12·6 per 1000 of their aggregate civil population, estimated at 17,312,295 persons for the year 1915. During the first 12 weeks of the quarter just ended the mean annual death-rate in these towns averaged 14·5, against 14·0 per 1000 in London. Among the several towns the death-rate last week ranged from 3·1 in Aberdare, 4·3 in Oxford, 5·5 in Wallasey, 6·3 in Acton, and 6·9 in Northampton, to 17·1 in Norwich and in South Shields, 17·2 in Wakefield, 18·6 in Gateshead, 18·8 in Oldham, and 23·3 in Tynemouth.

The 4196 deaths were 101 in excess of the number recorded in the previous week, and included 244 which were referred to the principal epidemic diseases, against 300 and 248 in the two preceding weeks. Of these 244 deaths, 77 resulted from whooping-cough, 67 from measles, 45 from infantile diarrhœal diseases, 27 from diphtheria, 15 from scarlet fever, and 13 from enteric fever, but not one from small-pox. The annual death-rate from these diseases did not exceed 0·7 per 1000, and coincided with that recorded in the previous week. The deaths attributed to whooping-cough, which had declined from 131 to 76 in the four preceding weeks, numbered 77, and included 13 in London, 9 in Birmingham, 8 in Manchester, and 3 each in Walthamstow, Southampton, Liverpool, and Warrington. The deaths referred to measles, which had been 104, 70, and 65 in the three preceding weeks, slightly rose to 67 last week; 11 deaths occurred in Sheffield, 10 in London, 6 in Birmingham, and 5 each in West Ham and Liverpool. The fatal cases of diarrhœa and enteritis (among infants under 2 years), which had been 58, 63, and 52 in the three preceding weeks, fell to 45, and included 16 in London and 4 in Sheffield. The deaths attributed to diphtheria, which had been 32, 52, and 34 in the three preceding weeks, further fell to 27, and included 4 each in London and Liverpool, and 2 each in Norwich, Birmingham, and Preston. The deaths referred to scarlet fever, which had been 8, 9, and 9 in the three preceding weeks, rose to 15, of which 3 were registered in Manchester and 2 in Salford. The fatal cases of enteric fever, which had been 8, 4, and 11 in the three preceding weeks, rose to 13, and included 2 each in London, Stoke-on-Trent, and Wigan.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had steadily declined from 1778 to 1302 in the 11 preceding weeks, numbered 1303 on Saturday last; 171 new cases were admitted during the week, against 163, 166, and 149 in the three preceding weeks. These hospitals also contained on Saturday last 1280 cases of diphtheria, 205 of whooping-cough, 190 of measles, and 38 of enteric fever, but not one of small-pox. The 1011 deaths from all causes in London were 105 in excess of the number in the previous week, and corresponded to an annual death-rate of 12·2 per 1000. The deaths referred to diseases of the respiratory system, which had been 117, 130, and 137 in the three preceding weeks, further rose to 157 in the week under notice.

Of the 4196 deaths from all causes in the 96 towns, 150 resulted from violence, 320 were the subject of coroners' inquests, and 1287 occurred in public institutions. The causes of 29, or 0·7 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in London and in its 14 suburban districts, in Sheffield, Bristol, Bradford, Hull, and in 59 other smaller towns. Of the 29 uncertified causes, 7 were registered in Birmingham, 3 in Liverpool, and 2 each in Southend-on-Sea, Manchester, and Blackpool.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,372,000 persons at the middle of this year, 1156 births and 608 deaths were registered during the week ended Saturday, June 24th. The annual rate of mortality in these towns, which had been 14·7, 12·9, and 12·2 per 1000 in the three preceding weeks, rose to 13·4 per 1000 in the week under notice. During the first 12 weeks of the quarter just ended the mean annual death-rate in these towns averaged 15·5, against 14·5 per 1000 in the large English towns. Among the several towns the death-rate last week ranged from 4·6 in Clydebank, 7·4 in Motherwell, and 9·2 in Falkirk, to 17·1 in Ayr, 17·2 in Perth, and 18·7 in Hamilton.

The 608 deaths from all causes were 53 in excess of the number in the previous week, and included 52 which were referred to the principal epidemic diseases, against numbers declining from 66 to 39 in the four preceding weeks. Of these 52 deaths, 19 resulted from measles, 11 from infantile diarrhœal diseases, 9 from diphtheria, 7 from scarlet fever, 4 from whooping-cough, and 2 from enteric fever, but not one from small-pox. The annual death-rate from these diseases was equal to 1·1, against 0·7 per 1000 in the large English towns. The deaths attributed to measles, which had been 26, 13, and 17 in the three preceding weeks, rose to 19, and included 14 in Glasgow and 2 in Clydebank. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 7, 12, and 4 in the three preceding weeks, rose to 11, of which 6 occurred in Glasgow. The fatal cases of diphtheria, which had been 5, 6, and 5 in the three preceding weeks, rose to 9, and comprised 5 in Glasgow and 2 each in Edinburgh and Leith. The deaths attributed to scarlet fever, which had been 5, 10, and 6 in the three preceding weeks, numbered 7, and included 5 in Glasgow. The deaths referred to whooping-cough, which had been 10, 9, and 7 in the three preceding weeks, further fell to 4, and comprised 2 each in Glasgow and Paisley. The fatal cases of enteric fever were registered in Glasgow and Greenock.

The deaths referred to diseases of the respiratory system, which had been 83, 92, and 75 in the three preceding weeks, were again 75 in the week under notice and were 17 below the number in the corresponding week of last year. The deaths from violence numbered 28, against 20 and 14 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the registration area of Dublin 263 births and 125 deaths were registered during the week ended Saturday, June 24th. The annual rate of mortality, which had been 19·3, 17·7, and 17·8 per 1000 in the three preceding weeks, fell to 15·9 in the week under review, against 12·2 and 14·1 per 1000 in London and Glasgow respectively.

Of the 125 deaths at all ages, 15 related to infants under 1 year and 25 to persons aged 65 years and upwards. The deaths referred to the principal epidemic diseases numbered 8, and comprised 3 from measles, 2 from infantile diarrhœa, and 1 each from enteric fever, scarlet fever, and whooping-cough.

The causes of 6 deaths were uncertified, and 3 others were the subject of coroners' inquests, while 59, or 47 per cent., of the total deaths occurred in public institutions.

During the same period 185 births and 108 deaths were registered in the city of Belfast. The deaths corresponded to an annual rate of 14·0, or 1·1 per 1000 less than in the previous week, and included 16 of infants under 1 year and 16 of persons aged 65 years and upwards. The deaths from the principal epidemic diseases numbered 11, against 9 in the previous week, and comprised 4 from infantile diarrhœa, 3 from measles, 2 from whooping-cough, and 1 each from enteric fever and scarlet fever. One cause of death was uncertified, and 1 death was the subject of a coroner's inquest, while 32 of the total deaths occurred in public institutions.

Correspondence.

"Audi alteram partem."

WOMEN MEDICAL STUDENTS AT KING'S COLLEGE, LONDON.

To the Editor of THE LANCET.

SIR,—The question of admitting women students in the Medical Faculty at King's College, London, has recently become urgent. We are constantly receiving applications from women who desire to study medicine here, but up to the present we have only admitted a few who are studying for the first examination (biology, chemistry, and physics) and a few who are taking physiology only for the second examination. Since the amalgamation of King's College for Women with this College we have been in the anomalous position of having opened all our classes to women with the single exception of those held in the anatomy department. As we are incorporated in the University of London this is not in harmony with the principles of that University. We have been for some time perfectly willing to open the anatomy department to women, but have hesitated to take this step because the hospitals associated with our medical school had refused to take on our women students for clinical instruction. St. George's Hospital has, however, made a step forward in admitting a limited number of women students to their wards; that experiment has proved such a complete success that we are hopeful that other hospitals will follow their example. The University has also brought pressure to bear upon us, and the delegacy of the College has assented to throwing open the whole of our medical department to women students next October. In the first instance, however, the number to be admitted will be limited to 20.

We are therefore now in the position to offer medical education to that number of women for the preliminary and intermediate portions of the curriculum, and we have but little doubt, seeing how quickly events are marching at present, that we shall be able to secure later for them the means of completing the final or clinical step of their education.

I am, Sir, yours faithfully,

W. D. HALLIBURTON,

Dean of Medical Science Faculty, King's College, London

June 23rd, 1916.

THE INFECTIOUS CONDITION OF PATIENTS DESQUAMATING AFTER SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—In view of the opinion now so generally held that there is but little risk of infection in connexion with patients desquamating after an attack of scarlet fever so long as there is no discharge from the nose or ears, the following incident is of interest and importance.

On June 3rd Captain H. was admitted into Mrs. Arnoldi's Hospital for Officers at Roland Gardens. He had been discharged from a fever hospital in France as convalescent from scarlet fever. He was found to be desquamating very freely on both feet. He had no discharge from either nose or ears. On June 5th he was admitted to an isolation hospital. There were four other officers in the ward to which he had been admitted. On June 12th one of these officers sickened with high temperature and general malaise, and on the following morning the characteristic rash of scarlet fever appeared. The officer had not left his bed for three weeks.

There can be no reasonable doubt that this patient contracted the disease from the officer admitted during the stage of desquamation.

I am, Sir, yours faithfully,

Green-street, W., June 26th, 1916. DONALD W. C. HOOD.

FAT-HEADEDNESS.

To the Editor of THE LANCET.

SIR,—During the past week the two assistants in this laboratory have been called up for service. There are some 80 soldiers in the hospital, and we are constantly required to examine blood, excreta, tissues, make vaccines, and so on. But the fat-headed committees cannot be made to see the harm they are doing by taking these men from laboratory work (useful to the soldiers) and turning them into ordinary soldiers.

I gather there's no use in appealing, but I hope you'll publish this. I am, Sir, yours faithfully,

R. G. HEBB.

The Laboratory, Westminster Hospital, June 27th, 1916.

THE EFFECT OF FERRIVINE AND INTRAMINE ON SYPHILIS.

To the Editor of THE LANCET.

SIR,—Mr. J. E. R. McDonagh, in his letter in your issue of June 24th, asks for the chemists who do not understand his chemistry. We were thinking chiefly of the remarks made by Professor W. M. Bayliss, F.R.S., at the discussion on Mr. McDonagh's paper on the Rationale and Practice of Chemo-therapy, which he read before the Dermatological Section of the Royal Society of Medicine on April 13th. Professor Bayliss then said, *inter alia*, "I find in the physico-chemical hypothesis much that conveys no definite meaning to me, while the statements appear to be contrary to the knowledge which we possess."

As to the clinical part of our paper, we can only say that our cases were faithfully reported and stand on record for any comparison which may be desired of intramine and ferrivine with other existing remedies. We can assure Mr. McDonagh that we really did see Sp. pallida in the preparations made from our cases which had been treated with intramine and ferrivine for some days. No bias on our part could have conjured them into the microscopical field, nor could it have produced the abscesses which occurred in the injection sites of our intramine cases. The cases were perfectly straightforward ones and the therapeutic effect of intramine and ferrivine on them was *nil*.

Mr. McDonagh complains that we have "rushed into print" on a small experience. Had the experience been in any way favourable such a complaint would have been justified; but it was not favourable, and one cannot continue indefinitely to experiment upon patients with remedies which are founded on what Dr. C. H. Browning at the discussion mentioned above described as "the highly speculative discussions in Mr. McDonagh's communication."

If Mr. McDonagh includes amongst those who are gaining from intramine and ferrivine "advantages unobtainable with any other existing remedies" a patient whom he showed at a recent meeting of the Dermatological Section of the Royal Society of Medicine, it is good evidence that his clinical observation is not uninfluenced by bias. This was a man who, after two months' (patient's statement) treatment with intramine and ferrivine, still exhibited active infectious lesions—viz., an ulcerated throat and an anal mucous patch.

We are, Sir, yours faithfully,

L. W. HARRISON,

June 26th, 1916. C. H. MILLS.

"PIRATE" DOCTORS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of June 17th Mr. P. Turner again publicly attacks doctors acting as locum tenens and as assistants for demanding a reasonable wage. Why? Surely when the wages of other occupations have gone up, some by 150 per cent., and when the cost of foods, &c., has gone up, doctors are equally entitled to raise their wage. He might as well attempt to argue that those doctors now in the army, and who receive £1, £2, or £4 per day and allowances, should not ask so much because those of them who hold public appointments still receive the whole or two-thirds of the salaries from such posts. Let the principals employing assistants or "locums" do as others now do—increase their fees. No one objects to the resident Poor-law hospital doctors increasing their charges from £120 to £300. No one objects to the fact that many of the leading steamship companies are now giving their surgeons £20 and £22 10*s.* per month and full shore pay for their services. I fancy there is too much mawkish sentimentality being served out during this war time. This "damned iteration" of doctors "fleecing the public" should be stopped.

I am, Sir, yours faithfully,

Liverpool, June 20th, 1916. ROBERT R. RENTOUL.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Captain J. Parker, R.A.M.C., attached to the Somerset Light Infantry.

Died.

Lieutenant G. S. Graham, R.A.M.C., graduated M.B., Ch.B. at Liverpool University in 1915, and joined the R.A.M.C. in February this year.

THE HONOURS LIST.

The following promotions and appointments of and awards to medical officers are announced :—

C.B.—Col. F. W. G. Gordon-Hall, A.M.S.; Lt.-Col. R. J. W. Mawhinny, R.A.M.C.

C.M.G.—Temp. Hon. Maj. A. C. Valadier, A.M.S.

D.S.O.—Maj. R. T. Brown, R.A.M.C.; Lt.-Col. (temp. Col.) A. C. E. Keble, R.A.M.C.; Temp. Capt. W. Dawson, R.A.M.C.; Capt. P. F. Gow, I.M.S.; Capt. W. A. Miller, R.A.M.C., Spec. Res. (attd. 22nd Bn., R. Fus.).

Military Cross.—Temp. Capt. F. C. Atkinson-Fleming, R.A.M.C. (attd. 8th Bn. R. Innis. Fus.); Temp. Lt. F. K. Marriott, R.A.M.C. (attd. Hdqrs. 182nd Fld. Arty. Bde.); Temp. Capt. C. M. Brophy, R.A.M.C. (attd. 18th Bn. Lond. R., T.F.); Capt. J. A. Cullum, Canadian A.M.C. (attd. 28th Infy. Bn.); Capt. A. E. Ironside, R.A.M.C., 4th Lond. Fd. Ambce.; Temp. Capt. J. M. MacKenzie, R.A.M.C. (attd. 6th Bn. North'd. Fusiliers, T.F.); Temp. Lt. C. C. Okell, R.A.M.C., No. 6 Fld. Ambce.; Capt. W. H. Riddell, I.M.S.; Temp. Capt. M. Peo, R.A.M.C.; Capt. J. S. Townley, R.A.M.C.; Capt. R. S. Townsend, I.M.S.

Second Class of the Indian Order of Merit.—Sec. Cl. Senior Assist. Surg. Bhagwan Singh (attd. 14th Ferozepore Sikhs), I.M.S.; 1st Cl. Sub.-Asst. Surg. Ishar Singh, 108th Ind. Fld. Ambce., I.M.S.

Indian Distinguished Service Medal.—1st Cl. Sub.-Assist. Surg. Tika Ram (attd. 128th Ind. Fld. Ambce.), I.S.M.D.

MENTIONED IN DESPATCHES.

The names of the following should be added to those given in THE LANCET of June 24th as having been mentioned in the despatches relative to the operations in Egypt :—

Australian and New Zealand Army Medical Corps.

Lt.-Col. (temp. Col.) H. C. Maudsley; Lt.-Col. B. J. Newmarch, V.D.; Lt.-Col. J. B. McLean; Lt.-Col. P. C. Fenwick; Maj. C. E. Maguire; Maj. F. T. Bowerbank; Capt. (temp. Maj.) T. F. Brown; Capt. (temp. Maj.) D. S. Mackenzie.

Indian Subordinate Medical Department.

Asst.-Surg. H. F. Hogan; 1st Class Sub-Asst.-Surgs. Tiloh Singh, Abdur Razzak, Gurditt Singh, Narain Singh.

OBITUARY OF THE WAR.

HENRY JOHN SULLINGS KIMBELL, M.R.C.S. ENG.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant H. J. S. Kimbell, who died in London on May 28th at the age of 36 years, entered St. Bartholomew's Hospital in 1899 and took his medical qualification in 1907. He then held in succession house appointments at the Bedford County Hospital, King Edward VII. Hospital, Windsor, the City of London Lying-in Hospital, the Soho Hospital for Women, and the Hospital for Nervous Diseases, Welbeck-street, with intervals of work as locum tenens in general practice. The war came as he was about to start in practice himself, and he accepted a commission in the Royal Army Medical Corps. He was attached to Chatham, and after serving there for some months was given charge of Preston Hall, Maidstone. Whilst there he was unfortunate enough to contract blood poisoning, from which he died.

A medical colleague writes of Lieutenant Kimbell: "Endowed by nature above the average, his kind disposition and perfect manner made him universally popular, while his untiring energy in his work was an inspiration to those with whom he came in contact. Unsparing in service for others he refused to give up his work until the illness which proved fatal was so far advanced that his physical condition was too weak to throw it off. He will be greatly missed by his friends and patients."

MAURICE HENRY DE JERSEY HARPER, M.B., B.S. DURH.,

SURGEON, ROYAL NAVY.

Surgeon M. H. de J. Harper, who lost his life on H.M.S. *Queen Mary* in the naval action of May 31st at the age of 27 years, was the elder son of the late Rev. H. B. Harper, a chaplain to the navy, and a nephew of Fleet-Surgeon A. F. Harper, R.N. He was educated at Elizabeth College, Guernsey, Pocklington and Trent Schools, entering Durham University, where he took his degree in June, 1914. He was then for a few months assistant medical officer at the Newcastle-on-Tyne City Asylum, Gosforth, leaving in September, 1914, to join the navy. His first appointment was at the Royal Naval Barracks, Chatham, and then to H.M.S. *Thames* for service with the naval ambulance train. He joined H.M.S. *Queen Mary* in March, 1916.

Surgeon Harper was keen on all forms of sport; he was captain of the Association football team at Durham University and a member of the cricket eleven.

HERBERT LYNE GEOGHEGAN, M.D., B.CH. DUB.,

FLEET-SURGEON, ROYAL NAVY.

Fleet-Surgeon H. L. Geoghegan, who was killed in action on H.M.S. *Black Prince* on May 31st, at the age of 44, was one of a large family of Irishmen, all of whom are serving their country. He went to school at Neuwied in Germany and afterwards studied at Trinity College, Dublin, where he took his medical degrees in 1896. His service in the navy was hard and varied; for a long time he was in a mine-layer, where his life was one of dreadful anxiety and constant danger. In East Africa he had been a big game shooter and presented spoils of the chase to Haslar Hospital. Fleet-Surgeon Geoghegan's death will be a great loss to the service. A very senior medical officer wrote of him: "He was one of the cheeriest of souls and kindest of men; he was also, to my certain knowledge, one of the very best of our medical officers, upon whom it was always safe to place implicit confidence and feel sure that he would never fail in the very tightest of corners. We cannot afford to lose officers of this stamp." To this testimony one who knew him intimately since student days in Trinity College, Staff-Surgeon J. Keogh Murphy, adds:

"Fleet-Surgeon Geoghegan did not aspire to high professional degrees, but wished to know his job, and he did know his job, as I have good reason to know at the Rotunda and elsewhere. He was a man who could be implicitly trusted. He was also a man who had a great gift of putting himself out of the case and thinking only of his patient's welfare. His personal attributes were extraordinary, always bright, cheery, alert, active, without a defect in his character; most popular, yet never seeking popularity, and absolutely adored by officers and men alike. No one who knew him would fail to realise what he would do in a tight corner, and what a help and comfort he must have been to many in the last moments of his existence." Fleet-Surgeon Geoghegan leaves a widow who is the sister of two senior medical officers in the service.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our list of those who have fallen during the war:—

Lieutenant J. D. Champneys, Leicestershire Regiment, elder surviving son of Sir Francis H. Champneys, of Littlemead, Nutley, Sussex.

Lieutenant H. R. Page, Canadian Infantry, second son of the late Dr. D. Page, of the Local Government Board, Whitehall.

Second Lieutenant W. R. Elphick, Indian Infantry, eldest son of the late Major H. W. Elphick, I.M.S.

Major G. H. Taylor, 39th Garhwal Rifles, Indian Army, second son of the late Surgeon-Major A. Taylor, I.M.S., Bengal Army.

Second Lieutenant E. G. B. Millson, Bedfordshire Regiment, only son of Dr. G. Millson, medical officer of health of the Borough of Southwark.

Lieutenant H. A. Llewellyn, South Wales Borderers, son of the late Dr. J. D. Llewellyn, of Bargoed, South Wales.

Armourer-Corporal J. O'D. Watson, only son of the late Lieutenant-Colonel J. Watson, R.A.M.C.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.

A meeting was held on Monday last at the Royal Army Medical College, Millbank, presided over by Sir Alfred Keogh, Director-General of the Army Medical Staff, to discuss the scheme formulated by a Provisional Committee for the creation of benevolent funds to benefit the auxiliary branches of the Royal Army Medical Corps. The scheme was published in substance in THE LANCET last week. After some debate it was decided to hold a further meeting in a month's time, more opportunity being thus provided for consideration of the scheme.

PHYSICAL TREATMENT FOR DISABLED SOLDIERS.—Major L. Haden Guest, R.A.M.C., sends us some notes on the treatment by mechano-therapy at the Hôpital Anglais in Nevers, an Anglo-French hospital established under his direction in November, 1914. The treatment is carried out in a separate building by Dr. L. J. Phelan, an American practising in Paris as an expert in applied exercises, movements, and massage. He employs a minimum of mechanical apparatus of the Zander type and a maximum of use of elastic cord exercisers. The latter have the great merit of economy, as the cost of the apparatus for the treatment of 100 patients daily need not exceed £200.

The apparatus consists of a number of rubber cords and pulleys, and by adapting the position of the patient and the exerciser and by attaching the exerciser either to the hand or foot a very large variety of movements can be obtained. Special apparatus can be made for individual finger movements, flexion and extension of wrists, pronation and supination, and so forth. The main characteristic of these apparatus is their simplicity. Movements of the hip are obtained partly by application of the exerciser to the foot and partly by the use of an inclined plane on which the patient lies. The plane is movable on runners placed below it and the patient pushes himself up by pressure with his feet. For passive movements of the ankle and knee in cases of great stiffness a mechanical apparatus on the Zander pattern cannot be dispensed with.

An analysis of 61 cases taken at random on Jan. 3rd, 1916, from the cases being treated at Nevers showed: foot and leg, 38; hand and arm, 22; shoulder, 6; hip, 3. Some cases have two injuries or more, and these are separately counted. Treatment is given daily, with an average duration of ten minutes, but a number of cases can be treated at the same time. The length of treatment required by individual cases varies much with the nature of the injury and the condition of the patient, but as a rough guide to the duration of treatment the following figures may be given: injury of hand, one week; wrist, one to two weeks; elbow, one month; knee, one month; adhesions (not affecting a joint), two to three weeks. At Nevers there have been so far 40 per cent. of cures, 40 per cent. greatly improved, and 20 per cent. not benefited. The possibility of progress or of cure can usually be discovered in from two days' to a week's treatment. Cases for treatment should be sent as soon as possible after any open wounds have healed.

USE OF THE RED CROSS EMBLEM.—The Secretary of the British Red Cross Society has sent us a memorandum (Form D. 14) on the use of the red cross, defining, with the approval of the War Office, its employment on uniform, placards, and motor-cars. The essential points are as follows:—

> The emblem may be properly displayed on the uniform of the personnel of the Society and of recognised Voluntary Aid Detachments; on the ambulances and other material, including cases of stores, and vehicles used solely for the conveyance of such stores; on the official notepaper of and other official documents issued by the Society or by its affiliated subordinate branches, and on the badges granted by the Society for proficiency in nursing, first aid, &c. On the other hand, the use of the emblem on placards is regarded by the War Office as undesirable and can only be permitted on the understanding that such use is carefully watched and controlled. It must be limited to placards or notices issued by the Society or its affiliated subordinate branches for the purpose of raising funds for the Society. Should it be used on placards advertising entertainments, bazaars, &c., the whole of the profits of such entertainments must be devoted in their entirety to the Society. In cases where the profits are divided, the emblem must on no account be used. The use of the Red Cross emblem in any form on private motor-cars is prohibited even when those cars are being used for the conveyance of sick and wounded soldiers. Permission can only be given for a private motor-car to carry the emblem if it is used *solely* for the conveyance of sick and wounded soldiers and has been handed over to the military authorities. In such cases written permission from the military authorities is necessary. With regard to the use of the Red Cross flag, private houses which have been handed over to the military authorities for the reception of sick and wounded soldiers are entitled to fly the flag when written authority for this purpose has been received from the War Office. In all cases where the Red Cross flag is flown over such establishments the Union Jack must be flown alongside it.

Chief constables have received instructions on the above lines, and they will bring to notice any irregular uses of the emblem.

THE CHILDREN IN BELGIUM.—Starvation presses most hardly on the young, and the growing child, if stinted of food, may well grow up permanently enfeebled. The children of occupied Belgium are dangerously near the limit between bare necessity and starvation, and Mr. John Galsworthy, in an eloquent letter which has been widely circulated, tells us that, in the National Relief Committee's view, unless aid comes in much faster than is the case at present the children will starve. A special device for raising money to prevent this is that on July 10th all British boys and girls shall hold sports, give concerts or entertainments of some sort, the proceeds of which shall go to the children of Belgium. The medical profession has already responded generously to the special needs of the Belgian doctors and pharmacists, and the appeal for the children will not fall on deaf ears.

Sir Thomas Anderson Stuart, Dean of the Faculty of Medicine of the University of Sydney, delivered a lecture on "How to Keep Fit" at the Liverpool Military Camp a year ago. This has now been reprinted and may be obtained from Mr. A. J. Mullett, government printer, Melbourne. The lecture contains simple advice, culled from many sources, suitable for the private soldier, and of a kind readily understood.

Y.M.C.A. CONCERTS AT THE FRONT.—The work done by the Y.M.C.A. in providing wholesome recreation for the fighting man whether at home or abroad is common knowledge. Since February, 1915, the Ladies' Auxiliary Committee, under the chairmanship of Princess Victoria of Schleswig-Holstein, has arranged for a series of concerts in conjunction with the association's huts, and there is ample evidence that their labours have been appreciated. In 15 months over 2000 concerts have been given and a

concert party has gone as far as Malta and the East. Music is without question a hygienic agent and one which can be used without stint. To enable the concert parties to continue their beneficent work donations are needed and will be acknowledged by the organiser, Miss Lena Ashwell, at 36, Grosvenor-street, London, W.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—H. N. Eccles (Sections I. and II.), Guy's Hospital; H. Lamb (Sections I. and II.), Manchester and Guy's Hospital; A. L. Malabre (Sections I. and II.), Washington; and M. B. M. Tweed (Sections I. and II.), Guy's Hospital.

Medicine.—H. Archer (Sections I. and II.), Bristol; R. H. Chadwick (Sections I. and II.), Leeds; A. L. Malabre (Sections I. and II.), Washington; L. A. B. Moore (Sections I. and II.), Guy's Hospital; E. G. D. Murray (Section II.), Cambridge and St. Bartholomew's Hospital; and A. L. Watts (Sections I. and II.), Oxford and University College Hospital.

Forensic Medicine.—H. Archer, Bristol; C. P. Barber, Charing Cross Hospital; A. L. Malabre Washington; M. M. Shaffi, London Hospital; and A. G. E. Wilcock, St. George's Hospital.

Midwifery.—L. A. B. Moore, Guy's Hospital; E. G. D. Murray, Cambridge and St. Bartholomew's Hospital; M. M. Shaffi, London Hospital; and L. J. Vincent, Cambridge and St. Mary's Hospital.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: H. Archer, H. N. Eccles, E. G. D. Murray, and M. B. M. Tweed.

VICTORIA UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful:—

Doctor of Medicine.—J. A. Fairer (with commendation), Francisco da Cunha, D. I. Dakeyne, Lovel Moss, and William Stirling, jun.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the Convocation held on June 27th the following degrees were conferred:—

Doctor of Medicine.—T. C. Storey, M.B., B.S. (*in absentia*).

Doctor of Medicine for Practitioners of 15 Years' Standing.—J. A. Barnes, M.R.C.S., L.R.C.P.; H. E. C. K. Murray, L.R.C.P. & S., L.F.P.S.; M. H. Smith, M.A., M.R.C.S., L.R.C.P.

Bachelor of Medicine (*M.B.*).—H. C. Broadhurst, Mary Russell Campbell, J. A Charles, H. G. B. Dove, H. Evers, N. A. Martin, G. N. Metzger, B.A., D. O. Richards, M.R.C.S., L.R.C.P., W. O. F. Sinclair.

Bachelor of Surgery (*B.S.*).—H. C. Broadhurst, Mary Russell Campbell, J. A. Charles, H. Evers, R. A. Hooper, M.B., N. A. Martin, G. N. Metzger, B.A., D. O. Richards, M.R.C.S., L.R.C.P.

Bachelor of Hygiene (*B.Hy.*).—J. E. Baker, M.D., B.S.

The following received the Diploma in Public Health (D.P.H.):—

J. E. Baker, M.D., B.S.

The following received the Licence in Dental Surgery (L.D.S.):—

G. C. Adie and W. Hall.

A PROPOSED PRESENTATION TO SIR LEONARD ROGERS.—It is proposed to present to the School of Tropical Medicine in Calcutta a portrait or bust, probably the latter, of Sir Leonard Rogers, in recognition of his untiring labour in obtaining contributions for the new building, which is now ready. A representative committee, consisting of the Hon. Surgeon-General W. R. Edwards, C.B., C.M.G., Lieutenant-Colonel W. J. Buchanan, C.I.E., Lieutenant-Colonel C. R. M. Green, and Dr. W. Willoughby Kennedy, is in charge of the arrangements. £2 has been fixed as the maximum for a subscription, which may be paid to Messrs. Thacker, Spink, and Co., 5, Government-place, Calcutta, to the credit of the Rogers Portrait Fund. The secretary of the fund is Lieutenant-Colonel W. D. Sutherland, I.M.S.

THE HIGHER TRAINING OF MIDWIVES.—A meeting of the Council for the Promotion of the Higher Training of Midwives was held, under the presidency of the Lord Mayor, on June 27th at the Mansion House. The main object of the meeting was to raise money for building a school of midwifery at Woolwich which should be of a national character. A site has already been procured and £13,000 collected towards the building fund, but another £13,000 are required. The work is at present being carried on at the Hospital for Mothers and Babies, Woolwich, containing 14 beds only. The Lord Mayor, in opening the meeting, said that it was necessary for drastic measures to be taken if child-life was to be preserved and the drain on the population caused by the war made up for. Lord Balfour of Burleigh said that according to the latest figures for England and Wales (the figures for Scotland were not yet available) about 1 in 10 of those born died under one year. Put in another way, there were more deaths among infants than among adults between the ages of 40 and 60. This wastage of life was largely preventable, and it was our duty to remedy the evil. A majority of the infants who survived suffered in after life from ailments due to lack of proper natal and ante-natal attention. The two main things required were trained and efficient midwives and adequate accommodation for special cases. Lady Betty Balfour said that some kinds of saving were equivalent to reckless extravagance, and no greater extravagance could be conceived than to refuse the £13,000 which were required for a work of such national importance as the saving of infant life. If proper maternity homes were provided the infant mortality could be reduced by at least one-half. Sir Dyce Duckworth, who said that we were far behind some of the continental nations in our measures for conserving infant life, made an earnest plea for the support of the work done by the Council for the Higher Training of Midwives. He remarked that a midwife required at least 12 months' training unless she had previously been a nurse. Dr. Barbara Tchaykovsky and Miss Alice Gregory also addressed the meeting.

THE LATE DR. C. MACGOWAN KITCHING.—Dr. Charles Macgowan Kitching, a well-known medical man in Cape Town, died suddenly while he was conducting an operation at Somerset Hospital, to which he was visiting surgeon, on May 9th, at the age of 52. Dr. Kitching was the son of a Cape Town practitioner. He was closely associated with the Cape College of Music and with the Chamber Music Union. He leaves a widow, who is widely known locally as a vocalist.

DONATIONS AND BEQUESTS.—Messrs. James Howell and Co., Limited, Cardiff, have forwarded a cheque for 500 guineas to the King Edward VII. Hospital, Cardiff, in support of Sir William James Thomas's appeal for extensions of the institution.

THE Albert Medal of the Royal Society of Arts has been awarded this year to Professor Elie Metchnikoff, of the Pasteur Institute, Paris, in recognition of the value of his inquiries into the nature of immunity. The annual report of the society estimated Professor Metchnikoff's discoveries as having contributed more than the work of any other living man to the control of infectious diseases.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Parliamentary Session.

THE House of Commons since its reassembling after the Whitsuntide recess has been mainly occupied with finance. Several new provisions are being considered for inclusion in the Finance Bill. Before a clause authorising new taxation may be included in it a preliminary resolution in Committee of Ways and Means is required. Such a resolution has been passed authorising the proposed duty on petrol permits at the rate of 6*d.* a gallon, but medical men will pay only half rates. One or two other important alterations in the terms of the Finance Bill are being brought forward. One of these will affect many professional men who make their savings in the form of endowment policies and deferred annuities. There has been an abatement of income-tax allowed on account of the premiums on the policies, but the Government now desire to restrict this concession in the case of future policies to those which are spread over not less than 20 years and mature not sooner than when the insured reaches the age of 60. Some alterations have been introduced into the scale of the reduced rates of income-tax payable by persons in the naval and military service of the Crown in respect of their pay. These give further concessions to the great majority of officers.

HOUSE OF COMMONS.

TUESDAY, JUNE 20TH.

National Health Insurance.

Mr. CHARLES ROBERTS (who represents the National Health Insurance Commissioners) made a statement in Committee of Supply on the work which had been accomplished by the various commissions. He said that their work had been seriously interfered with by the war. They could not get funds in the shape of Exchequer grants for new services and fresh developments which might have been contemplated in normal times. Their staffs had been depleted by the calls made upon them for military service. The war had also brought new problems. They had carefully to watch the administration of benefits to soldiers who had been invalided. They had to deal with the medical attendance for the dependants of

soldiers. A great deal of work had been put into the task of coördinating a sufficiency of doctors for both civilian and army needs. There had also been the safeguarding of the national supply of drugs, as to which the Government had charged the department with special powers. He ought to remind honourable Members that war conditions made it impossible to deal administratively with a number of questions which were too controversial to touch at the present time. For instance, it had often been suggested in the course of the last 12 months that something might be done with regard to sanatorium treatment or with questions connected with the payment of medical men. When the whole medical profession was being mobilised for the needs of the army it was out of the question to attempt to revise or consider in any way the terms of the agreement which was originally framed. He frankly admitted that during the war period there must be a policy of deliberate marking time. That was not, as it was called, a policy of drift. He was glad to think that some tightening up of the Regulations had now been carried through. The process of consolidating those Regulations, at all events so far as the English Commission was concerned, was now practically complete. They were consolidated into codes under separate heads—for instance, Approved Societies, army and navy, collection of contributions, and so on. There were some gaps. The medical benefit regulations had to be left until the return of peace. He hoped in the course of a few weeks to get a volume published which would contain the Act, the Orders, and the Regulations. Having dealt with various administrative and financial matters, the honourable gentleman proceeded to say that anyone who knew the work which had been going on in the country knew that since the Act came into force there had been a very considerable progress shown in counties and county boroughs in tackling the great evil of tuberculosis. With the money which had been available both through the Insurance Act and by means of what was known as the Hobhouse grant, the country had been covered with a network of hospitals, sanatoria, and dispensaries, and in connexion with that, by voluntary effort and otherwise, there had been tuberculosis school and care committees set up. He did not consider that that process was complete. The counties and the county boroughs in a considerable number of cases had fairly comprehensive schemes, but the work, of course, was largely, though not entirely, suspended by the war. Honourable Members might be interested to know that in this Vote—Vote 9 in the Estimates—there was an addition of £40,000 this year. The Insurance Commissioners were concerned not in the question of the provision of buildings, as that was the work of the Local Government Board, but in the question of the treatment of persons, and taking the year 1914, for which alone he had full information, he could give some indications of the measure of the advance. The applications for treatment that year increased by 6 per cent. The persons treated increased 17 per cent. The cases treated in residential institutions increased 69 per cent., and the cases treated in dispensaries increased 232 per cent. He had not got full information for 1915, and it was quite impossible at the present time to press insurance committees to give information in detail, but such partial information as he had received pointed in this direction. Dispensary treatment in 1915 went up to a very large percentage. The treatment in residential institutions dropped by a small percentage, which was not greater than the reduction in the insured population during the year. Meanwhile he could assure those who thought that the sanatorium benefit was really drying up that there were vacancies in different parts of the country. He was told that in Scotland there was no difficulty in finding room for all the tuberculous soldiers and that there were vacancies in some of the institutions for the civilian population in addition. He ought to say something about the tuberculous soldiers, who had been treated with special attention. The Commissioners had had 3250 cases mentioned to them by the War Office. They had an arrangement under a special grant for which money was being taken this year by which they could get priority of treatment for these tuberculous soldiers, and he believed treatment had been offered in residential institutions for all those whose cases had been mentioned to them. He quite admitted that the Commissoners had not so large a fund as he would like them to have. The fund was limited, but the need unfortunately was not limited. Still, under the Insurance Act, since it had come into force a sum of £2,800,000 had been found. It had been spent on an attack on tuberculosis by means of sanatorium benefit, and so far from that fund drying up, insurance committees in 1916–17 would have an income of £760,000, including a grant of £35,000 for tuberculous soldiers. When the war was over he hoped to see a still larger expenditure of money in eradicating as far as possible tuberculosis from this country. He stated that a sum of £28,000,000 had been accumulated as a reserve under the National Insurance Act. In 1915 men and women received a sum of £6,300,000 in sickness benefit, £1,300,000 in maternity benefit, and £840,000 in disablement benefit.

THURSDAY, JUNE 22ND.

The Sale of Cocaine.

Colonel NORTON GRIFFITHS asked the Home Secretary what steps the Government were taking to control the sale of cocaine throughout the country, and whether the sale of this drug could be restricted under the Acts governing the sale of poisons.—Mr. HERBERT SAMUEL replied: The sale of cocaine to members of His Majesty's forces has been made an offence by order of the Army Council under Regulation 40 of the Defence of the Realm Regulations. Under the Acts governing the sale of poisons cocaine can only be sold by registered chemists to persons known or introduced to them, and after entering in the Poisons Book the particulars required by the schedule to the Act of 1868. I am considering what further action should be taken.

Sir J. D. REES: May I ask whether the sale of cocaine has become dangerous since the suppression of opium and whether that point of view will be taken into account?—Mr. SAMUEL: I do not know that this matter is related to the question of opium, but I am informed that there has been increased use of cocaine among certain chemists.

Sir J. D. REES: Will the right honourable gentleman inquire whether it is not a matter of common public knowledge that this has resulted from the suppression of the less dangerous opium?—Mr. SAMUEL: The class which is addicted to cocaine at the present time is not a class which has ever been addicted to opium.

Colonel NORTON GRIFFITHS: Do I understand that it is the intention of the Government to take very definite steps to stop the growth of this habit?—Mr. SAMUEL: We are considering in what way the present law needs strengthening.

Sir RICHARD COOPER asked the right honourable gentleman whether his attention had been drawn to the widespread sale of "pick-me-ups" containing ether and cocaine in West End shops; whether he was aware that the new regulations preventing the sale of cocaine did not affect these draughts which contained coca liquidum, and that these doses were generally responsible for creating the drug craving; and what steps he proposed to take to prevent the spread of this evil.—Mr. SAMUEL replied: I would refer the honourable Member to the reply I have already given. The honourable Member appears to have been misinformed as to coca liquidum, which, being a preparation of coca, is covered by the recent Order of the Army Council. This substance is, moreover, in Part II. of the Schedule to the Poisons and Pharmacy Act, 1908, and is therefore subject to the restrictions as to sale laid down in the Poisons and Pharmacy Acts. Ether is not a poison within the meaning of those Acts.

Non-poisonous Dopes.

Mr. ROWLANDS asked the Under-Secretary of State for the Home Department whether he was aware that an inquest was held on May 13th on Annie E. Baron, who died on May 7th at Bridlington, when the doctor said the illness was due to uræmic poison caused by working in an atmosphere of dope which contained a poison known as tetrachlorethane; whether he was aware that on May 17th an inquest was held at Southampton on Annie Metcalf who worked at the Belvedere works on dope varnishing; would he say whether the doctor who made the post-mortem examination stated that he thought that the continued breathing of the fumes of the varnish which the deceased used at her work had circulated into the system and had set up jaundice, which was the cause of death; and, if so, could he state what further steps were being taken to secure the use of non-poisonous dope.—Mr. BRACE replied: I regret that the facts are as stated. As I explained on May 11th, the arrangements for securing an adequate supply of an approved non-poisonous dope were maturing and they will, I hope, be completed very shortly. Meanwhile, much is being done to minimise the danger by the use of such other non-poisonous dopes as are available and are found suitable by the Admiralty and the War Office and by an increasing observance of the detailed precautions in regard to ventilation, periodic medical examination, and other matters which have been laid down in the instructions issued by the Factory Department.

Mr. ROWLANDS: Are all non-poisonous dopes in the market being utilised at the present time, or are we to have more of these deaths before we arrive at a non-poisonous dope?—Mr. BRACE: All non-poisonous dopes which the Admiralty and War Office consider suitable for the purpose are used by them. The Admiralty and the War Office are developing as fast as they can a non-poisonous dope. They are doing their best.

Splints and Surgical Appliances for Soldiers.

Major ASTOR asked the Financial Secretary to the War Office whether the War Office provided for officers undergoing treatment in recognised hospitals all splints and other surgical appliances which might be ordered by the surgeons in charge of the cases.—Mr. FORSTER wrote in reply: All splints and other surgical appliances considered necessary by the officer in charge of a hospital for officers or men

undergoing treatment in recognised hospitals other than purely private hospitals and those receiving a capitation grant are provided by the War Office.

Deafened Soldiers.

Mr. HOGGE asked the Financial Secretary to the War Office whether there were any special provisions for the treatment of soldiers deafened as a result of active service comparable to those for the blind.—Mr. FORSTER (in a written answer) replied: Such soldiers would receive the regulated disability pensions according to their incapacity, but there are no special provisions similar to those undertaken by Sir Arthur Pearson in the case of the blind.

MONDAY, JUNE 26TH.

Small-pox and Vaccination.

Major ASTOR asked the President of the Local Government Board how many persons who were notified as having contracted small-pox during April and May had been vaccinated; how many had been recently revaccinated; how many had never been vaccinated; and whether any cases were fatal.—Mr. LONG wrote in reply: During the nine weeks ended May 27th, 1916, 79 civil cases of small-pox were notified in England and Wales. As to 2 of the cases I have not received information as to their vaccinal condition. Of the remaining 77 cases, 62 had been vaccinated and 15 were unvaccinated. No person contracted small-pox subsequent to recent revaccination, but 12 of the cases had been revaccinated after exposure to small-pox infection and during the incubation period of the disease. Seven cases are known to have been fatal, and of these 3 were unvaccinated and 4 were stated to have been vaccinated in infancy, their ages at death being 27, 37, 43, and 63 respectively.

Treatment of British Prisoners at Ruhleben.

In reply to Mr. MALCOLM, Lord ROBERT CECIL (Under Secretary for Foreign Affairs) said: On May 31st we received a further report by Dr. Taylor on the food-supply and nutrition at Ruhleben, showing that since Dr. Taylor's first report was drawn up a fresh scale of diet had been put in force and that civilians at Ruhleben were receiving only a little more than one-third of the protein-carrying foods allowed to combatant prisoners of war, while the potato rations of the civilians had been reduced to less than one-half of those issued to combatant prisoners. On June 3rd we informed the German Government, through the United States Ambassador, that if they were not in a position to feed prisoners of war in their hands properly it was clearly their duty to release them. We pointed out at the same time that, so far from doing so, they were detaining persons entitled to repatriation on the ground of ill-health and had made no reply to our proposal that civilians over 50 should be repatriated and those over 45 also if unfit for service in the field. We pointed out that the German prisoners in our hands were not dependent on parcels for nourishment. We said we were ready to consider any proposals for an exchange of civilians on an extended scale. We asked the United States Ambassador to inquire the numbers, and, if possible, the names of the men at Ruhleben who were receiving no parcels. On June 8th we asked Mr. Gerard to obtain permission, if possible, for us to send at fixed intervals sufficient food in bulk for 500 men. As the result of Dr. Taylor's report the Prisoners of War Help Committee decided to send parcels for 250 men in addition to those previously sent. On June 21st we received a still more unfavourable report by Dr. Taylor, from which it appears that the German authorities have deliberately reduced the official food rations at Ruhleben, and that they have accumulated a large sum of money, estimated at between 60,000 and 200,000 marks, which should have been spent in rations. Dr. Taylor states that the food supplied during the week ending June 14th, if applied to all the men interned at Ruhleben, represents less than half of the requisite food units, and that matters are made worse by the fact that much of the bread coming from outside Germany during the last month is of inferior quality or has arrived in bad condition. As the result of this report, we addressed a note to Mr. Page for communication to the German Government by telegraph recapitulating the observations in our note of June 3rd as to the duty of the German Government to feed the prisoners properly or to release them, and as to their failure to reply to our proposals to release civilians over 50 and over 45 in certain conditions, and concluding by proposing that all the British civilians at Ruhleben should be released in exchange for a similar number of German civilians, and stating that, should the German Government not accept this proposal within a week from the receipt by them of the telegraphic summary of this note, we should be compelled to consider what course to adopt with regard to the rations of German civilians interned here. The correspondence will be laid before Parliament as soon as possible.

TUESDAY, JUNE 27TH.

Surgeon-General Sir W. Babtie.

Colonel YATE asked the Secretary for India to state for what length of time Surgeon-General Sir W. Babtie, the Director of Medical Services in India, and the officer stated to have been responsible in regard to medical provision for the expedition to Mesopotamia, was absent from his post during certain months of 1915; and who was appointed to officiate for him during his absence.—Mr. CHARLES ROBERTS (for Mr. CHAMBERLAIN) replied: Surgeon-General Sir W. Babtie left India for a short time early in 1915 to carry out certain work entrusted to him by the War Office. He was not replaced during his temporary absence. He vacated the appointment of Director of Medical Services in India in June, 1915, when he was succeeded by Surgeon-General MacNeece. I am not aware by what authority General Babtie is stated to have been responsible for the medical arrangements in Mesopotamia, and I would deprecate any such assertion.

Callosity and Industrial Disease.

Mr. FENWICK asked the Home Secretary whether his attention had been called to the industrial disease known as callosity; and, if so, whether, having regard to the nature of the disease, he could see his way to include it in the list of industrial diseases provided for under the provisions of the Workmen's Compensation Act.—Mr. H. SAMUEL answered: I am aware that callosity, which is a hardening and thickening of the superficial layers of the skin, is common, especially on the hands and fingers in certain occupations, but I am advised that it cannot be regarded as a definite disease and does not of itself cause incapacity. It could not, therefore, be scheduled under the Act.

Medical Men and Petrol Supplies.

In the course of the proceedings in committee on the Finance Bill Mr. MCKENNA (the Chancellor of the Exchequer) moved a new clause dealing with motor spirit licence duty. It lays down that "in addition to any other duties imposed by law in respect to motor spirit, there shall be charged, levied, and paid on a licence to be taken out by any person who desires to be supplied with motor spirit a duty at the rate of sixpence for every gallon of motor spirit with which he is authorised to be supplied by the licence." It goes on to provide that "any duly qualified medical practitioner or registered veterinary surgeon using motor spirit for the purpose of supplying motive power to a motor-car or motor-cycle kept by him, while it is being used by him for the purposes of his profession, shall be entitled, in accordance with regulations made under this section, to an allowance or repayment of half the amount of duty payable under this section in respect of a licence authorising the supply of that motor spirit." In the course of the discussion Mr. McKenna said that he must warn motorists not to proceed on journeys when there was danger of their authorised supply of petrol giving out. They would not be entitled to purchase anything in excess of the authorised amount. Each individual application for a supply of petrol would be judged on its merits.

Sir HENRY CRAIK drew attention to the difficulties which might arise when the supply of petrol which a medical man was authorised to purchase became exhausted prematurely. Medical attendance in some parts of the country had already been rendered more difficult to afford, and it would be very hard indeed that a medical man should be prevented from giving prompt attention to an urgent call because it was not possible for him to obtain a supply of petrol. Special permits might well be given to medical men.

Mr. MCKENNA: The observations made by my honourable friend are very much in point. The matter will have to be considered by the Petrol Committee and the Board of Trade. I think that ought to be brought home to the mind of the Petrol Committee.

The new clause was inserted in the Bill.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BROWNE, A. E., L.R.C.P., L.R.C.S. Irel., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Levenwick District of the county of Shetland.

GALLOWAY, N. R. (final-year student), Resident Physician at the Royal Infirmary, Edinburgh.

HENDRY, G., M.D., Certifying Surgeon under the Factory and Workshop Acts for the Ollaberry District of the county of Shetland.

HUXLEY, FRANCES M., M.D., B.Sc. Vict., Pathologist and Registrar to Queen Charlotte's Lying-in Hospital, Marylebone-road.

KIRK, Y. B. (final-year student), Resident Surgeon at the Royal Infirmary, Edinburgh.

STUMP, C. (final year student), Resident Physician at the Royal Infirmary, Edinburgh.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ALTON, HANTS. LORD MAYOR TRELOAR CRIPPLES' HOSPITAL.—Assistant Resident Medical Officer.

BEDFORD COUNTY HOSPITAL.—Assistant House Surgeon, unmarried. Salary as arranged, with board, &c.

BETHNAL GREEN INFIRMARY, Waterloo House, Waterloo-road, N.E.—Assistant Medical Officer. Salary at rate of £280 per annum, with board, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street.—Resident Surgeon. Salary £200 per annum, with board, &c.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—Resident Medical Officer and House Surgeon. Salary £300 per annum and £200 per annum respectively, with board, &c.

BOLTON INFIRMARY AND DISPENSARY.—Female Third House Surgeon. Salary £180 per annum, with board, &c

BRISTOL ROYAL INFIRMARY.—House Surgeons and House Physicians. Salary at rate of £120 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CAMBERWELL INFIRMARY, Brunswick-square.—Medical Superintendent, &c., for Institution at Gordon-road, Peckham, and Children's Homes. Salary at rate of £750 per annum, with unfurnished, house, &c.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL.—Senior House Surgeon. Salary £250 per annum, with board, &c.

DUDLEY, GUEST HOSPITAL.—Senior Resident Medical Officer. Salary £150 per annum, with board, &c.

ESSEX COUNTY COUNCIL.—Temporary Assistant Tuberculosis Officer. Salary at rate of £350 per annum, &c.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—Clinical Assistants.

GREAT YARMOUTH HOSPITAL.—House Surgeon, unmarried. Salary £200 per annum, with board, &c.

HUDDERSFIELD ROYAL INFIRMARY.—Senior House Surgeon. Salary £150 per annum, with board, &c.

HULL, VICTORIA HOSPITAL FOR SICK CHILDREN.—Female House Surgeon. Salary £100 per annum, with board, &c.

LEAMINGTON SPA, WARNEFORD GENERAL HOSPITAL.—Junior Resident Medical Officer. Salary £150 per annum, with board, &c.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant Resident Medical Officer for six months. Salary at rate of £120 per annum, with board, &c. Also Surgical Registrar. Salary at rate of 40 guineas per annum.

MANCHESTER CITY.—Medical Officer. Salary £350 per annum.

MANCHESTER ROYAL EYE HOSPITAL.—Junior House Surgeon. Salary £120 per annum.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with board, &c.

METROPOLITAN ASYLUMS BOARD.—Temporary Dental Surgeon. Salary £350 per annum

NORTHAMPTON GENERAL HOSPITAL.—House Surgeon. Salary £150 per annum, with board, &c.

PORTSMOUTH WORKHOUSE INFIRMARY, WORKHOUSE, AND CHILDREN'S HOME.—First Assistant Medical Officer. Salary £250 per annum, with apartments, rations, &c.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL.—House Physician. Salary £150 per annum, with board, &c.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months, and Senior Resident Medical Officer for following four months. Salary at rate of £60 per annum first four months and £80 per annum following four months, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician for six months. Salary £100 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

WEST RIDING OF YORKSHIRE, MIDDLETON-IN-WHARFEDALE SANATORIUM, near Ilkley.—Assistant Medical Officer. Salary £350 per annum.

Births, Marriages, and Deaths.

BIRTHS

BANGAY.—On June 26th, at Westlands, Warblington, Hants, the wife of Surgeon J. D. Bangay, R.N., H.M.S. *Antrim*, of a son.

CANNEY.—On June 27th, at Buckland-crescent, Hampstead, the wife of Major Leigh Canney, R.A.M.C., of a daughter.

HAYNES.—On June 25th, at Borstal, Rochester, the wife of Captain H. G. L. Haynes, R.A.M.C., of Markfield, Leicestershire, of a son.

MARRIAGES.

HANCE—LEONARD.—On June 24th, at St. Peter's, Wolvercote, Oxon., Captain J. Bennett Hance, B.A., M.B., B.Ch. Cantab., Indian Medical Service, to Catherine Henriette Lawson, only child of the late Charles Lester Leonard, M.A., M.D., of Philadelphia, U.S.A., and of Mrs. Leonard, of Woodstock-road, Oxford.

DEATHS.

CHURCHILL.—On June 22nd, at Cranley-gardens, Queen's Gate, S.W., Frederick Churchill, M.D., F.R.C.S., in his 74th year.

OSBURN.—On May 10th, at Mussoorie, India, from cerebral apoplexy, Harold Burgess Osburn, M.R.C.S., D.P.H. Camb., second son of Captain Francis Osburn, R.N., of Winsley, Emsworth, Hants, in his 49th year.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

TREATMENT OF TYPHUS FEVER BY THOROUGH VENTILATION

To the Editor of THE LANCET.

SIR,—In my Chadwick Lecture on typhus fever, in THE LANCET of June 10th (p. 1159), it is erroneously implied that Barrault, a Paris physician, was the first to introduce the system of thorough ventilation in the treatment of this disease, whereas the credit of having first advocated this treatment belongs to our distinguished countryman, Professor Sir Clifford Allbutt, who nearly 30 years previously both preached and practised it during the epidemic at Leeds in the year 1865–66.

I am, Sir, yours faithfully,
June 28th, 1916. R. O. MOON.

WAR VICTIMS' RELIEF IN FRANCE.

THE work of the War Victims' Relief Committee of the Society of Friends in the devastated districts of the Marne and the Meuse continues in spite of the fact that nearly two years have elapsed since the line of the armies moved to any appreciable extent. At the maternity at Châlons-sur-Marne 262 babies were born up to the end of May, and 1152 persons treated in all. The convalescent home at Bettancourt-la-Longue continues full of girls, many of them brought away from the dangers of the Rheims streets. In Bar-le-Duc the condition of the *émigrés* requires constant supervision from the nurses of the party. For all of these and for work in the villages of the whole district, in many of which medical aid of any kind is unobtainable, the help of an additional medical man or woman is urgently needed, as will be seen from a notice in our advertisement columns.

KAFIR BEER.

To the Editor of THE LANCET.

SIR,—Will you kindly have the accompanying specimen of kafir beer analysed for alcoholic strength and bacteriologically? The beer is made very crudely from a millet larger than that used in India for food. It is grown largely here by natives, ground down, fermented, and drunk to excess. Intoxication lasts for three or four days after being once affected.

I have observed the following effects directly attributable to its prolonged use: (1) painless enlargement of liver without jaundice; (2) early arterio-sclerosis of visible arteries; (3) asthenopia with white optic discs; (4) early cataract; (5) gastritis and dysentery in old and young respectively; (6) reflexes ultimately in comparatively young people suffer—e.g., knee-jerks. I learn that in various parts of South Africa brewers use this kafir corn for making lager beer. Lately a black rust has appeared in the corn, which may influence the action of the beer.

As regards the clinical pathology, I do not think I can add to what I have given.—I am, Sir, yours faithfully,

WM. ROBERTSON.

St. Marks, Cape Province, South Africa, May 22nd, 1916.

*** The sample forwarded was inadequate for a systematic examination and was not even sufficient for the estimation of the alcohol alone. Our correspondent might consult one of the local Government analysts. The matter is quite interesting enough to have the examination suggested made.—ED. L.

THE DESTRUCTION OF COCKROACHES.

To the Editor of THE LANCET.

SIR,—Dr. J. J. H. Holt quite ignores the possibility that cockroaches *eat* insect powder, if free. In my experiments many of the younger cockroaches were quite dead, and his experiments were so contrived to prove that contact with the powder is not enough to cause that. But whether they are dead or not, strewing insect powder along the junction of floors and walls has proved in my experience a very cheap and simple way of getting rid of cockroaches. I should think if something palatable was mixed with the powder the results would be even more satisfactory. Experiments *in vitro*, such as Dr. Holt's were, are very likely to lead to erroneous conclusions, unless the hypotheses suggested by them are tested carefully by other experiments devised in a scientific manner, a thing which, apparently, it has never even occurred to Dr. Holt to do.

I am, Sir, yours faithfully,
Sidmouth, June 26th, 1916. G. BURTON-BROWN, M.D.

A GERMAN MEDICAL EDITOR TO HIS CONTRIBUTORS.

Dr. J. Schwalbe, editor of the *Deutsche Medizinische Wochenschrift*, addresses his contributors thus (1916, No. 22): "I must ask my medical colleagues again further to be patient in regard to the publication of their work. It is self-evident that the limitation of space due to the war on the one hand and the diminution of the printing staff on the other, must inevitably delay the setting up of the articles. This delay affects longer articles more than shorter ones. For this reason, also contributors should restrict the volume of their MSS. as far as possible, and avoid every addition in the way of tables or curves, &c., which is not absolutely necessary." In a similar request to our contributors we are on common ground with the German editor.

Veteran.—The jurisdiction of the Central Midwives Board is confined to certified midwives and does not extend to persons who are acting as maternity nurses under the direction of a doctor. To constitute the offence of "covering" an uncertified woman it is of the essence of the offence that she should be acting as a midwife.

Medical Examiner of Recruits has omitted to enclose his card.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROBERT BARNES HALL, 1, Wimpole-street, W. (by permission of the Royal Society of Medicine).

WEDNESDAY.—8 P.M., Mrs. Mary Scharlieb, M.D.: Inherited Disease in Children (illustrated by the epidiascope). (Lecture III.)

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX AND TITLE-PAGE TO THE LANCET. January to June, 1916.

IN view of the Government restrictions upon the supply of paper, and the shortage of paper quite apart from these restrictions, we cannot include, as usual, in all the copies of THE LANCET the Index and the Title-page which are due now. These are being prepared, and copies will be supplied gratis to subscribers who intimate their wish to receive them to the Manager, THE LANCET Office, 423, Strand, London, W.C. Such application should please be sent in at once.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 4.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

Newspapers are not at present being sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. The Publisher of THE LANCET has obtained the required permission, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, June 28th, 1916.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
June 22	30·030	S.W.	...	120	69	53	55	59	Cloudy
,, 23	29·870	S.W.	0·01	101	69	59	59	63	Overcast
,, 24	29·840	S.	0·02	121	66	56	56	60	Cloudy
,, 25	29·910	S.W.	...	121	71	55	57	64	Cloudy
,, 26	29·830	S.	0·04	96	64	53	54	57	Cloudy
,, 27	29·690	W.	0·02	118	67	55	56	58	Cloudy
,, 28	29·720	W.	...	117	66	55	54	55	Cloudy

The following magazines, journals, &c., have been received:—Pediatrics, Archives of Pediatrics, Archives de Médecine et de Pharmacie Militaires, Pacific Medical Journal, Malaria, Canadian Journal of Medicine and Surgery, Canadian Medical Association Journal, American Medicine, &c.

BOOKS, ETC., RECEIVED.

HARE PHARMACY, Amherst-street, Calcutta.
Outlines of Medical Jurisprudence. By Ramesa Chandra Ray, L.M.S. Third edition. Price Rs.4.

HARPER AND BROTHERS, London.
Body and Spirit: An Inquiry into the Subconscious Based upon 12,000 Experiences in the Author's Practice. By John D. Quackenbos, M.D. Price 6s. net.

KHOSLA BROTHERS, Railway-road, Lahore.
Vocabulary of Indian Medicinal Substances and Drugs. In more than Five Languages, along with their Therapeutic Values, Chemistry, and Terminology. By C. M. Gupta, F.T.S. Price Rs.10.8.0.

LUND, PERCY, HUMPHRIES, AND CO., London.
Surgical Bandages and Dressings. By Alice Scott. Price 3s. 6d.

MACDONALD, ERSKINE, London.
Letters from Another Battlefield. Price 1s. net.
Songs of Protest. By Frederick L. Mitchell. XXth Century Poetry Series. Price 1s. net.

THACKER, SPINK, AND CO., Calcutta and Simla.
Handbook for Wives and Mothers in India. By Mildred E. Staley, M.B., L.M. Second edition. Price 5s. net.

Communications, Letters, &c., have been received from—

A.—Captain C. H. Attenborough, R.A.M.C.; Captain H. G. L. Allford, R.A.M.C.(T.); Académie de Médecine, Paris, Librarian of; Mr. G. F. Aldous, Plymouth; Messrs. Allen and Hanburys, Lond.; Dr. J. Aikman, Guernsey; Anglo-French Drug Co., Lond.; Major Edward Archibald, C.A.M.C.

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